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# Top of the World

POINT BARROW, Alaska.—Up here at the "top of the world" petroleum is making its usual vital contributions in seeing that the Arctic United States is prepared to do its part in shaping the course of future world events.

World War II ended the isolation of the Arctic area in Alaska where for many years the white man rarely came except for a few weeks during the summer. Analysts since the war's end are in agreement that the polar region is now the northern crossroads of military strategy with the further realization that Russia's and Europe's polar areas are much larger and more extensively developed than that of the North American Continent. Military-wise, more and more leaders of this country are in agreement with the late Gen. Billy Mitchell's contention of several years ago that "Who controls Alaska controls the world."

The development of this region largely revolves around oil. Within the month another of the yearly expeditions by ship will be consummated. The ice along the shore will move out into the Arctic long enough to permit four ships to approach this coast and then with landing equipment, perfected during the war, thousands of tons of supplies, including exploration and drilling equipment, will be brought to this point. The base supplies for another year will provide vast numbers of drums of gasoline, diesel fuel, and furnace oil.

Petroleum is conquering the Arctic. A better standard of living for the Eskimo is one result, including relief from the bitter cold of the long winter period, without interfering with the activities of these native citizens.

This same petroleum not only furnishes heat but it also fuels the various types of land and amphibious vehicles, all of which operate during some part or all of the year. More important, gasolines fuel the airplanes which have brought this region within less than 12 hours from Seattle.

All this has made possible the exploration work which has been under way for 3 years in Naval Reserve 4, a 35,000-sq. mile area set aside by President Harding in 1923 because preliminary geological work and oil seepages at several points indicated oil. A description of these activities will appear in this publication soon.

Never have reconnaissance and exploratory work in a prospective oil area been carried on under more difficult conditions or more quickly. Practically every tool of those who seek new oil supplies has been used including airborne, surface, and subsurface equipment. Two new tests are now drilling on well-defined structures. Many months of hard work preceded the spudding in of these tests.

The objective is to determine within a reasonable period if this area will supply Alaska's Arctic with indigenous oil and provide proved reserves large enough to justify pipe-line transportation.

C. O. WILLSON.

**PETROLEUM—A *PROGRESSIVE* INDUSTRY**

# Fate of Oil Legislation in Doubt As Congress Nears Adjournment

*by Henry D. Ralph*

WITH Congress now heading into its annual adjournment jam, the prospects for passage of any particular piece of legislation are exceedingly uncertain, and the outlook for enactment of bills of particular interest to the oil and gas industry is not bright.

Under the Congressional Reorganization Act, Congress may not remain in session beyond July 31 unless both House and Senate agree to a later date. Leaders have informally set Saturday, July 26, as the goal for sine die adjournment, but no official action has been taken. Since this is not the end of the Eightieth Congress, all bills will retain their status over the recess and Congress will pick up where it left off at the next session, which will start next January unless there is a special session in the fall.

In the rush to recess, it is always possible for an adroit sponsor to get pet legislation called up suddenly for quick action, but the situation also favors parliamentarians who want to postpone action on something. The average legislator is willing to agree to take up anything its sponsor says is noncontroversial and will not require much debate, and to agree with a plea that something else requires so much consideration that it should not be taken up hastily. This makes it virtually impossible to predict what will happen during the closing days of the session.

### Appropriations Carry Priority

Congress must pass all appropriation bills, and they have the right-of-way. So do conference reports on bills passed by both houses. High priority is generally, but not always, given to bills which have passed the other chamber. Congressional leaders are currently squabbling over a schedule giving the priority to a dozen relatively noncontroversial measures and sidetracking others which have both strong support and opposition.

Neither list contains measures of specific application to the oil and gas industry, so such bills may or may not get fitted into the chinks.

The big fight, which will largely determine the final adjournment date, is over the personal income tax bill which President Truman has promised to veto again even though the effective date has been changed to next January. Republican strategy was to send this bill to the White House more than 10 days before adjurnment so the president could not give it a "pocket veto." If the veto message comes back a day or two before the scheduled adjournment, Senate opponents of the bill could easily filibuster to prevent a vote on overriding, so for this reason the end of the session may not be set until the fate of the tax bill is known.

Three important oil industry matters hang in the balance as the congressional session nears its end. These are the Anglo-American petroleum treaty, the Rizley natural-gas bill, and legislation affecting the submerged oil lands which the Supreme Court said belong to the federal Government. As of this moment it is anyone's guess whether or not any one of them will see final action before the recess.

### OGD Funds Undecided

The fate of the Oil and Gas Division will definitely be decided, because Congress must pass an appropriation bill for the Interior Department. The House passed a bill with no funds for OGD and the Senate amended it to give the division enough to carry on in a limited fashion.

Legislation to continue the Interstate Oil Compact, which otherwise would have expired in September, has already been passed. So has legislation continuing export and certain other wartime controls, and a measure dropping virtually all restrictions on commercial and industrial construction. No attempt will be made at this session to write a permanent policy for retaining the synthetic-rubber industry. The Senate is almost certain to pass a House bill freezing the social-security tax at its present 1 per cent each on employers and employes, which otherwise would jump to 2½ per cent each January 1.

The oil treaty is already on the Senate calendar, and Senator Vandenberg, who is both president pro tempore and chairman of the foreign relations committee, might try to get action on it if he saw a "hole" in the schedule. However, both Texas senators and some others are likely to make such lengthy speeches in opposition that the chances are that the Senate leadership will let this go over to the next session rather than take the time necessary to crowd it through during the closing days.

The Rizley gas bill is one of those "noncontroversial" measures which might slip through in a dull moment. The House passed it quite handily, and the Senate commerce committee was prepared to push it hard. Since the chief opposition now comes only from the Federal Power Commission which would lose much of its present jurisdiction, there is little doubt that the bill would pass the Senate if given normal time for debate. But Senate rules are such that a single opponent can block consideration or threaten to take up so much time in discussion that the leadership may prefer to put it over until next year.

There is also the possibility of a presidential veto of the Rizley bill. The bill's supporters scoff at the idea that Mr. Truman would "waste" a veto on such a minor measure and incur congressional opposition. However, the president is on record as asking that the bill be deferred until FPC completes the report on its natural-gas investigation. And if the bill should go to the White House less than 10 days before the end of the session the president can pocket veto it by simply neglecting to sign it.

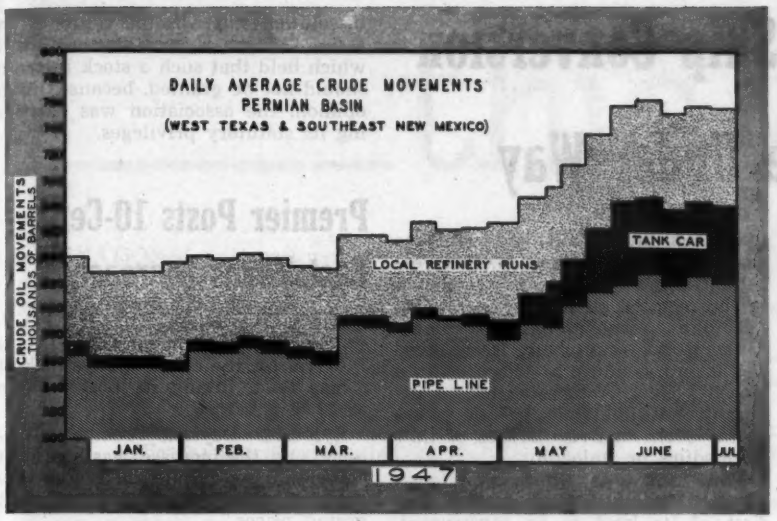
The "tidelands" matter may require some emergency legislation before adjournment. Ever since the Supreme Court decision, California and federal officials have been closeted discussing the next step. The present plan, as near as can be learned, is a stipulation among all parties on an interim working plan for continuing oil operations off the California coast until such time as permanent settlement can be obtained on the many issues in controversy. *(See page 51).*

It is probable that this interim plan will require some legislation during this session of Congress, and a request for such is expected from the White House momentarily. Under the circumstances Congress cannot be expected to enact any permanent legislation relating to offshore oil lands, but it might put through a stop-gap measure to preserve the status quo for a few months.

## Price Increases Bring Texas Antitrust Probe

AUSTIN.—As a result of the ½-cent boost in tank-wagon prices of gasoline last week, Attorney General Price Daniel has ordered an investigation to determine whether the state's antitrust laws have been violated. Staff lawyers were assigned to the case with instructions to cover the entire field of refinery, wholesale, and retail gasoline sales.

In Dallas, one of the first cities to come under study in the state-wide investigation, the investigators were to talk with filling-station operators, large wholesalers, and then the oil-company officials. Seven major companies were named by Daniel as having made uniform price advances.




*Increasing demand for crude oil has stepped up movements in the Permian Basin area. This chart illustrates the amount taken by tank cars, pipe lines, and local refineries since January 1*

# West Texas Granted Major Gains In State Allowable Increase

***by George Weber***

WITH the statement that "there is no crude-oil shortage in Texas," by its chairman, E. O. Thompson, the Texas Railroad Commission last week increased state allowables 90,238 bbl. daily. The boost brings withdrawals from the state to a new record volume. The upward revision of summer proration figures promptly followed a hearing held July 9 at the request of three major purchasers seeking higher allowables to meet the record summer demand for petroleum products.

On the basis of testimony showing that additional movements could be made from West Texas, and that recent shipments had resulted in withdrawals from storage, the commission granted increases there and elsewhere in the state. Made effective July 10 for the remainder of July and August, the total boost exceeded both the requests made by purchasers and the allowable cut made July. It served to adjust withdrawals to better conformance with recently determined estimates of maximum efficient production rates of major pools throughout the state.

The bulk of the increase, 72,256 bbl. daily, applied to West Texas which remains the sole major producing area capable of meeting a substantial increase in allowable without exceeding MER. As a result, crude movements from that area, including local refinery runs, may top 800,000 bbl. daily this summer.

The total allowable increase last week was authorized by the commission in two actions. The first raised the state's permissible production 79,033 bbl. daily, including the 72,256 bbl. daily in West Texas. Later in the week, the commission announced an allowable increase of 11,205 for 10 Gulf Coast fields which were raised to MER levels in view of the adequacy of pipe-line facilities. These increases were retroactive to July 10.

### New Mexico Increase Due

Much of the West Texas allowable was increased by extending producing days on several pools from 21 to 24 per calendar month. Other increases in producing days, exemptions from shutdown, and straight allowable boosts for pools already so exempt accounted for the remainder of the 72,256-bbl. gain in the area. To add to available crude in the Permian Basin, New Mexico is expected to increase its allowable this month.

The principal factor in the swollen withdrawal rate is a record tank-car movement of West Texas and New Mexico crude to Mid-Continent and Gulf Coast refineries. Looping of existing main lines has added some pipe-line capacity since the first of the year. The normal effect of higher summer temperatures on line capacity also accounted for a share in the increase.

The tank-car movement, a costly measure, is expected to increase substantially during the remainder of the summer before it tapers off, probably late this autumn. No important relief to be afforded by added pipe-line capacity is expected this year. Completion of the Texas-Shell-Empire 150,000-bbl. line to Oklahoma *(see page 111)* will provide the first important addition to much-needed outlets for reserves in the Permian Basin.

### More Rail Movement Planned

As indicated in the accompanying chart, the 120,000-bbl. increase in daily movements of Permian Basin crude since early this year was accomplished mainly by a marked increase in rail shipments, augmenting pipeline gains and to a lesser extent, local refinery runs. The bulk of rail movement currently originates at Atlantic Pipe Line Co.'s 74-spot Midland loading rack which is approaching 50,000 bbl. in its daily shipments for Atlantic, Humble, and Magnolia. Rail movement this summer will be swelled by addition of two and possibly three other loading points. At Wink, Shell Oil Co., Inc., has reactivated its 32-car rack and plans to load 5,700 bbl. daily of Winkler type crude for Stanolind Crude Oil Purchasing Co., destination, Whiting, Ind.

Cosden Petroleum Corp. at Big Spring will load for Shell, an additional Houston-bound 8,500 bbl. daily through its refinery racks, served by a 6-in. line from Wasson. Another major company is considering construction of a loading rack on the Santa Fe railroad at McCamey, capable of handling up to 30,000 bbl. daily destined for the Gulf Coast.

### Sufficient Pipe Lines in Prospect

Proposed new pipe-line improvements, plus the new line to Oklahoma, indicate an ultimate capacity approaching 940,000 bbl. daily out of the Permian Basin. The 150,000-bbl. California line planned by Shell and other companies would swell capacity well over 1,000,000 bbl. daily *(The Oil and Gas Journal, May 24, page 60)*. Million-barrel daily movements from West Texas and New Mexico are believed a definite possibility in 1949, by well informed observers in that area. Continued exploration and development of new reserves at present rates should add each month, at least 5,000 bbl. daily to the producing capability of the area within the limits of most efficient production rates. The major programs for casinghead gas utilization already under way will augment the Permian Basin's prominent position as a future source of crude and gas.

# First Dry-Cargo Ship Conversion To L.P.G. Use Under Way

AN interesting and revolutionary ship-conversion project is now under way at the Beaumont, Tex., yards of Pennsylvania Shipyards, Inc. The project involves the conversion of a Type C 1-A dry cargo vessel into a special tank ship to transport L.P.G. in large quantities in coastwise or foreign service.

The dry-cargo vessel was purchased by Warren Petroleum Corp. through its subsidiary, Warren Maritime Corp., from the U. S. Maritime Commission early this year. *(The Oil and Gas Journal, January 18, page 37).*

Sixty-eight specially designed tanks are being prepared for installation in the ship. The long necks on the tanks are one of the many important safety features being built into the ship. They permit all connections to be attached above the top deck. Valves, fittings, gages, safety devices, etc., accordingly will be subject to easy testing and inspection. The vessel and a few of the tanks are shown in the pictures on the opposite page.

Unlike conventional petroleum tankers, this equipment is designed so that all products are handled in a closed system. Automatic devices instantly shut tank and pipe-line valves in the event of irregularities of flow in loading or unloading.

This tank ship, to be christened the S.S. Natalie Warren, will be the first of its kind to be constructed. The many new and special safety features all meet standards of the U. S. Coast Guard and American Bureau of Shipping.

A large L.P.G. and natural-gasoline terminal at Norsworthy, Tex., near Houston, has just been completed, from which various Warren products will be loaded for ocean movement.

# Kansas Supreme Court Holds Co-Op Activities Are Authorized

THE Consumers Cooperative Association, of North Kansas City, Mo., has been authorized to carry out its extensive industrial activities in Kansas under a ruling handed down July 12 by the state's Supreme Court which refused to dissolve the organization as requested by State Attorney General Edward F. Arn.

Arn charged in the hearing that C.C.A. has outgrown its organizational purpose as a farmers' cooperative, now having more than $20,000,000 invested in oil refineries, pipe lines, oil wells, acreage, royalties and leases, lumber mills, printing plants, and other activities.

C.C.A. owns and operates oil refineries at Coffeyville, Kans.; Phillipsburg, Kans., and Scottsbluff, Neb., and holds a third interest in a refinery at McPherson, Kans. In addition, it has production from more than 450 wells.

In a unanimous opinion, the court held that under the state Cooperative Marketing Act, C.C.A. is not limited to the sale of agricultural products, but may "engage in any activity in connection with manufacturing, selling, or supplying to its members of machinery, equipment, or supplies." However, the court ordered the state Corporation Commission to hold hearings for the purpose of registering common and preferred stock issued by the cooperative.

The court said in its decision that "the question of taxes is not concerned in this case." This was believed to have been included because of the continual controversy over whether cooperatives have an advantage over corporate business because of income-tax exemptions.

### Arn's Comment

Commenting upon the case, Arn stated that the decision permitted cooperatives chartered under the Kansas act to conduct any business they choose from "automobiles and antiques to zinc mines and xylophones." Jeff A. Robinson, Corporation Commission chairman, stated that the decision was a clarification of the Securities Act of Kansas inasmuch as it required registration of C.C.A. securities. He added, "The Corporation Commission has maintained consistently that there was no express exemption for any securities which were the basis of this litigation as far as the commission was concerned."

In a separate case, the court ordered Secretary of State Frank J. Ryan to file an amendment to C.C.A.'s articles of incorporation permitting an increase of capital stock from $2,000,000 to $12,000,000. The attempted dissolution suit was the result of an action of the state Charter Board which held that such a stock increase should not be granted, because, in its opinion, the association was exceeding its statutory privileges.

## Premier Posts 10-Cent East Texas Increase

PREMIER OIL & REFINING CO. has posted an increase of 10 cents a barrel for the crude it buys in East Texas field, hiking its posted price to $2.05 a barrel.

Sylvester Dayson, Premier president, said the increase was "to meet competition of certain purchasers who are paying premiums above current posted prices."

Premier, which has refineries in East Texas field and at Fort Worth, set the stage for the 25-cent advance in crude prices of March 10 when it posted a 10-cent advance on January 10. In that raise, major companies did not follow suit until 2 months later.

Early this week, no other company had followed Premier's lead.

Premier purchases between 4,000 and 7,000 bbl. daily. East Texas field production now is about 335,000 bbl. daily.

## Ten Barges to Be Built For Butcher-Arthur, Inc.

Contracts totaling $1,500,000 have been awarded by Butcher-Arthur, Inc., Houston, for the construction of ten 19,000-bbl. barges and three 1,400-hp. river towboats. The barges will be designed for operation in two-barge high-speed units.

Delivery on the new equipment will be made over the period from August through March of next year. It is anticipated that this additional capacity will provide transportation for 3,500,000 bbl. annually of petroleum products from the Gulf Coast area to terminals on the Mississippi and Ohio rivers.

## Seminole Celebrates Oil Discovery Anniversary

The 21st anniversary of the discovery of oil in the Seminole, Okla., area was celebrated in that city July 16 with a parade, banquet, technical display, and dance.

The celebration was sponsored by the Seminole chapter of the American Petroleum Institute's Division of Production and the Junior Chamber of Commerce. Harold B. Fell, executive vice president, Independent Petroleum Association of America, was the featured speaker.

# this week

**INTERNATIONAL**—Unconfirmed reports indicate oil discovery in Far East Oil Development Co.'s wildcat on Cebu Island in Philippines. . . . ¶Efforts to reach final settlement with C. S. Gulbenkian, minority partner in Iraq Petroleum, continue. . . . Reports say separate agreements covering production in 1952-56 and 1957-61 have been suggested. . . . ¶Creole's May production averages 555,393 bbl. daily, a drop from the 574,522-bbl. figure for April. . . . ¶Favorable geological findings lead to five tests now drilling in Oldenburg in Britain's German zone.

**NATURAL GAS**—Rizley bill passes House by wide margin but runs into stiff opposition in Senate. . . . Observers consider chances of passage this session not good. . . . White House pressure on Senate to shelve bill reported. . . . ¶Michigan Consolidated proposes in FPC application to construct additional pipe-line and gas-storage facilities in Michigan. . . . ¶Pennsylvania waives objections to use of Big Inch for natural gas in action at hearing on permanent operation by Texas Eastern Transmission in Washington. . . .

**PRICES**—Texas officials launch antitrust investigation into several industries, oil included, as a result of recent uniform price increases. . . . Oil industry officials in Houston vigorously deny any collusion, say increases forced by rising costs. . . . ¶Premier Oil Refining posts 10-cent higher price for crude from East Texas field in move regarded as possible forerunner to general advance. . . . Sylvester Dayson, company president, declares increase necessary to meet premiums now being paid. . . .

**REFINING**—Reports from Lake Charles say Cities Service planning new construction there to cost between $20,000,000 and $30,000,000. . . . Disclosure made by Louis D. Mann, Cities Service official, in testimony on suit contesting city-limits expansion. . . . ¶Texas Co. officials in Dallas refuse to confirm report Dallas refinery will be abandoned in 1948. . . . J. S. Leach, vice president, says operations being changed rather than abandoned. . . .

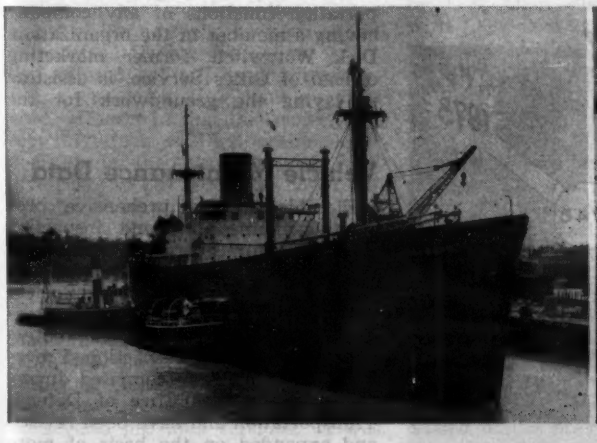
**PRODUCTION**—Texas Railroad Commission authorizes allowable increases of some 90,000 bbl. daily. . . . Boosts given mostly to West Texas fields where testimony indicates transportation facilities will handle greater amounts. . . . Tank-car movements of crude from area gain. . . .

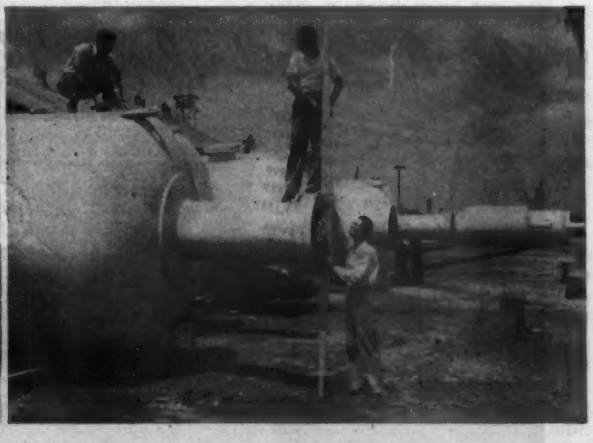
**CO-OPS**—Kansas state officials lose in court fight aimed at dissolution of Consumers Cooperative Association which has widespread properties in oil industry. . . . State Supreme Court holds activities authorized under Agricultural Marketing Act. . . .

**LABOR**—C.I.O. Oil Workers Union and Pure reach settlement ending 108-day shutdown of operations at Pure's 55,000 bbl. daily refinery at Smiths Bluff, Tex. . . . Company announcement says new contract does not differ materially from that in effect at time walkout was called, points out 240,000,000 gal. of products lost as a result of the dispute. . . .

**EQUIPMENT**—Commerce Department places export controls effective July 15 on both seamless and welded casing and line pipe. . . . Individual licenses to be required. . . .

**EXPLORATION**—Tide Water opens gas-condensate pool in Wharton County, Texas. . . . ¶Humble completes gas-distillate well in Wood County, Texas. . . . ¶Discovery in Aransas County, Texas, is a dual completion in gas-condensate pay at 7,058-65 ft. and oil at 7,126-36 ft. . . . ¶Shell test in Long Beach, Calif., area unofficially reported flowing 650 bbl. 32.7°-gravity oil per day. . . . ¶West offset to Leduc discovery shows gas and 3,300 ft. oil on drill-stem test. . . .





*The C '-A dry-cargo vessel purchased by Warren Petroleum Corp. from the U. S. Maritime Commission arriving at the shipyards in Beaumont. Right, a few of the specially designed tanks to be fitted into the vessel in its conversion to a special tank ship to move L.P.G.* *(See story, opposite page)*

# Rotary-Drilling-Rig Activity Reaches Wartime Peak

*by Leigh S. McCaslin, Jr.*

ACTIVE rotary drilling rigs reached a peacetime high of 1,873 as of June 30, according to figures released by the Interstate Oil Compact Commission. In addition to being a peacetime record, the total equals the wartime high of 1,873 which was established in November 1944.

Drilling thus joins refinery runs and crude production in the industry's record-breaking activity. The increased program of drilling results from higher crude prices and the unprecedented demand for petroleum products. The fact that this program is being undertaken in the face of a tubular-goods shortage indicates that more pipe is becoming available or expected to be available soon.

Active rotary rigs started on the upswing last February and have increased at a steady rate since that time. *(See accompanying chart).* The increase for June as compared with May is the most spectacular jump for the 5 months' period with an added 125 rigs running.

The significance of the present drilling activity is all the more apparent when compared with 1941 when the active rotary-rig figure ranged from 900 to 1,200 per month and averaged around 1,100. Thus far this year the average monthly figure is 1,683, a considerable increase.

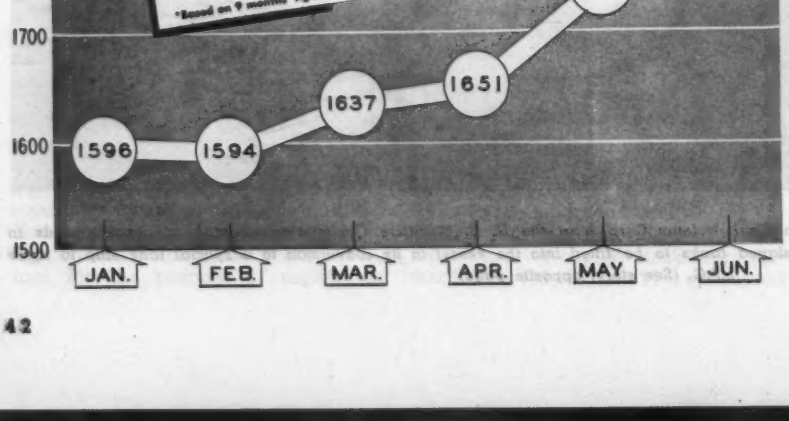
### Regional Activity

A breakdown by areas discloses that increased activity in the Rocky Mountains (including western Canada) and the West Texas, New Mexico, and North Texas area has contributed the major portion of new rigs for the June high. Ninety additional rigs have gone to work in the Rocky Mountains since February and 63 in the West Texas, New Mexico, and North Texas area. Obviously, summer weather is the answer to a good part of the Rocky Mountain spurt.

On a percentage basis Kansas and the area including Illinois, Indiana, Kentucky, and Michigan, have shown substantial increases having gained 24 and 26 per cent respectively since February. A statistical breakdown by areas follows:

DRILLING ACTIVITY BY AREAS

| | June 1947 | Feb. 1947 | June 1946 |
|---|---|---|---|
| Pacific Coast | 144 | 127 | 133 |
| Kansas | 115 | 93 | 85 |
| Oklahoma | 217 | 202 | 165 |
| Rocky Mtn. (inc. W. Canada) | 167 | 77 | 129 |
| N. La., E. Tex., Ark. | 160 | 134 | 163 |
| W. Tex., N. M., N. Tex. | 455 | 392 | 356 |
| Gulf Coast (inc. U.S.) | 512 | 487 | 400 |
| Ill., Ind., Ky., Mich. | 103 | 82 | 124 |
| Total | 1,873 | 1,594 | 1,555 |




## 8,000,000 Bbl. Daily to Fuel Another War

FEAR of the military for an adequate oil supply in the event of another war were exemplified July 12 when Kenneth C. Royall, undersecretary of war, said in a nationwide broadcast that petroleum requirements in another emergency may run as high as 8,000,000 bbl. daily.

He pointed out that the Army and Navy needed 2,000,000 bbl. daily in the last war and that their requirements in another war could easily be twice that figure. To this, he added the 3,000,000 to 4,000,000 bbl. which he said would be the minimum for essential civilian use.

Royall declared that "there is a question whether the productive capacity of the United States could give us that much oil." The War Department, he said, is depending on the Middle East to make up any deficit between domestic production and requirements in the event of another war. Oil, he added, cannot be economically stockpiled.

Also on the program was W. John Kenney, assistant Navy secretary. Discussing the military's general stockpiling program, they said the project is behind schedule and that the storage of vitally needed materials will require 6 years and $2,500,000,000 instead of the 5 years and $2,000,000,000 previously estimated.

## Transportation Club Now Being Organized

A movement to organize a transportation club within the petroleum industry to be composed of officials engaged in rail-truck, water, and air transportation is now under way.

Purpose of the club is defined as social only. An outline of the proposed organization together with membership applications have been distributed. In a letter to prospective members, A. G. Anderson, Socony-Vacuum Oil Co., Inc., New York, temporary chairman, and R. R. Hooper, Cities Service Oil Co., New York, said it has been suggested by several members of the 25-Year Club, with whom the idea has been discussed, that membership be restricted to 300 members, including the executive officer directly in charge of the transportation functions of any company having a member in the organization. Dick Wotowitch, former marketing official of Cities Service, is assisting in laying the groundwork for the club.

## Vehicle Maintenance Data

Flexible and comprehensive preventive-maintenance and inspection programs for operators of motor-vehicle fleets have been made available by the publication by the Society of Automotive Engineers of its Recommended Practice on Preventive Maintenance and Inspection Procedure. The data were compiled during the war for the Office of Defense Transportation and have been revised and expanded on the basis of more recent experience by the S.A.E. transportation and Maintenance technical committee.

# House Passes Rizley Bill But Senate Opposition Develops

WASHINGTON.—Hopes of the industry for passage this session of legislation clarifying the Natural Gas Act received a setback as a result of action in the Senate this week.

Opposition to the measure developed in the Senate's interstate and foreign commerce committee which received the Rizley bill after its passage by a heavy majority in the House. Objections of some members of the Senate committee centered on a provision allowing common-carrier pipe lines for natural gas.

Sen. E. H. Moore and Rep. Ross Rizley, both of Oklahoma, were considering cutting this provision out of the bill in an effort to gain passage. However, considerable opposition was still expected, and the White House was reported to have asked that the bill be side tracked (for further comments on prospects of passage, see story, page 38).

Earlier the bill was passed by the House without a vote but immediately after a motion to recommit was lost by a roll-call vote of 64 to 254, which indicated the degree of support for the measure. This motion was to send the bill back to the committee on interstate commerce with instructions to substitute language proposed by the Federal Power Commission which would simply have removed independent producers and gatherers of natural gas from FPC jurisdiction, leaving other sections of the act unchanged.

### Separate Bill

This FPC proposal had been incorporated in a separate bill introduced earlier in the week by Rep. Percy Priest of Tennessee, a member of the committee. During the debate Priest had offered his bill as a substitute, but it was defeated without a record vote. He argued that this would correct the effects of the Supreme Court decision in the Interstate case and give relief to gas producers now fearful of control of FPC, and that other changes in the law should wait until the commission makes its natural-gas report in the fall.

Except for one clerical amendment offered by the committee, the House made no changes in the revised bill (H.R. 4051) introduced by Rep. Ross Rizley of Oklahoma as agreed to by the committee after lengthy hearings on several previous versions. It was brought up under a special rule permitting but one hour of general debate, but there was little serious opposition to the measure. Some members expressed the fear that unregulated field prices of gas would mean higher prices to consumers, while others questioned the wisdom of acting on other than the production and gathering section at this time.

Representative Priest also made an unsuccessful attempt to delete the new section of the bill which permits a common carrier to build a gas pipe line under the jurisdiction of the Interstate Commerce Commission, arguing that its meaning and application are uncertain and that it has no place in a bill relating to the Federal Power Commission.

## West Edmond Unit Plan Decision Due This Month

Evidence presented during 18 days of testimony in the unit-operation case concerning the Hunton lime zone of West Edmond field is now being studied by the Oklahoma State Corporation Commission with an opinion expected by the end of the month.

If the application for unitization is granted, it is expected that the commission's order will be appealed to the state Supreme Court. The application was filed with the commission January 29 and was signed by operators controlling over 60 per cent of the proved acreage in the pool.

## Socony-Vacuum Tanker Towed From Philippines

The Socony-Vacuum Oil Co., Inc., tanker, Mobilube, reached San Francisco late last week from the Philippines after one of the longest towing jobs ever undertaken.

The 16,000-ton tanker was torpedoed in January 1943 and subsequently used as a floating storage vessel in the Pacific. It was reacquired by Socony-Vacuum for $555,000 and will be repaired for resumption of its peacetime job moving products between the Gulf and Atlantic coasts. The Standard Vacuum tanker Yorba Linda brought the Mobilube to San Francisco after towing time of 45 days and 3 hours from Subic Bay in the Philippines.

# Pure, O. W. I. U. Reach Agreement to End Smiths Bluff Strike

THE 108-day-old strike at Pure Oil Co.'s largest refinery, the Smiths Bluff plant, Nederland, Tex., was ended July 15, according to announcement by J. P. Langfitt, vice president in charge of refining.

The new contract was negotiated by J. S. Allen, plant superintendent, with Local No. 228, Oil Workers International Union, C. I. O., and relates only to wages, hours, and working conditions at the Smiths Bluff plant and was reported not to differ materially from the contract in effect at the time the strike was called.

The strike was precipitated March 28 by the union demand for a company-wide contract. The company had offered a wage increase which paralleled the increase granted by other oil companies and was at the same rate as finally incorporated in the new contract. Under the amendment to the Wagner Act a voluntary revokable checkoff was included in lieu of a maintenance of membership clause included in the previous contract.

"As a result of the strike," a company announcement said, "240,000,000 gal. of petroleum products have been lost to the consuming public and approximately $850,000 in wages have been lost to the employes and the community. New construction at the plant has been delayed, and it is now difficult to predict when the new units will go into operation.

"It is possible that some of the work originally planned may not now be undertaken in the immediate future."

The picket line was removed from the main entrance of the plant at 6 a.m. July 15, allowing the refinery's 650 employes to return to work. An hour later, Superintendent Allen addressed the workers in an open area inside the refinery and welcomed the group back to work. He was applauded both before and after he spoke.

Negotiations with union committees have been resumed on a local basis at two other smaller Pure refineries located at Cabin Creek, W. Va., and Toledo, Ohio. These strikes were also called last March 28 to support the union demands for a company-wide contract. These two refineries have a combined capacity of 35,000 bbl. daily. Also, still unsettled is the strike called by the C. I. O. union among Pure's production employes in Cabin Creek, W. Va., field.

# International

WORLD-WIDE OIL DEVELOPMENTS

## Oil Discovery Reported in Test On Cebu in Philippines

REPORTS that the Far East Oil Development Co. has found crude oil on the Island of Cebu in the Philippines have reached the United States from Reuters News Service and other sources, but in all cases the information remains sketchy.

A Reuters dispatch from Manila said, "The news is regarded with extreme caution as no official comment is forthcoming." Sources in New York stated commercial possibilities have not yet been determined though oil shows were found at around 1,600 ft. and became more pronounced around 8,200 ft.

More unofficial comment on the company's test in northern Cebu indicates that the drilling is over a fair-sized salt dome and that there are possibilities for developing a fairly good commercial output.

Last year a contract was signed between Far East Oil Development Co. and Occidental Corp., a Transamerica Corp. affiliate, under which the technical direction and drilling in the Philippines would be handled by Capitol Corp., Occidental's operating unit.

Late in 1941 a test was drilled to 8,300 ft. where oil sands apparently had been discovered. On December 2 plans were under way for a flow test but before final preparations were made Pearl Harbor had been bombed. The hole was plugged and all production equipment destroyed. Early this year a deep-test rotary rig was shipped to Cebu accompanied by a California drilling crew.

Far East Oil Development Co. is controlled by Andres Soriano, who acquired a concession from the commonwealth government to explore for oil on Cebu before the war. Geological surveys indicated that the possibilities were favorable. During the war Soriano served as a colonel with General MacArthur. Since the end of the war Soriano has been in the United States, presumably to obtain financing with Transamerica interests.

A few months ago there were unconfirmed reports that large United States oil interests were seeking a concession in the Philippines to conduct exploratory and possibly development operations provided suitable terms could be obtained from the Philippine Government. These negotiations are still presumably being carried on.

### A.I.O.C. Figures Show 1946 Output at 19,189,551 Tons

Total Iranian crude-oil production of Anglo-Iranian Oil Co., Ltd.—the only oil company operating in Iran—for 1946 climbed to 19,189,551 tons (404,820 bbl. daily) compared with 16,839,490 tons (355,153 bbl. daily) for 1945, according to the company's official figures.

Anglo-Iranian's crude-oil output in the United Kingdom dropped to 55,387 tons (1,168 bbl. daily) in 1946 compared with 71,542 tons (1,509 bbl. daily) in 1945.

Iranian output in March of this year was 1,430,000 tons (367,033 bbl. daily) compared with 1,717,000 tons (440,696 bbl. daily) for March 1946. Iranian crude production for February of this year was 1,378,000 tons (353,688 bbl. daily).

Total Iranian production for the first 3 months of this year was 4,448,000 tons (380,551 bbl. daily) compared with 4,784,000 tons (409,297 bbl. daily).

### Sumatra Oil Refinery Partially Repaired

Turbine electric equipment in the 45,000-bbl. refinery of Nederlandsche Koloniale Petroleum Maatschappij (Standard Vacuum Oil Co. subsidiary in the Netherlands East Indies) near Palembang, Sumatra, has been fully restored to operation, although the refinery has not yet processed any crude.

R. H. Soper of the General Electric Co. service engineering division, aided by mechanics and laborers from N.K.P.M., has succeeded in restoring the war-damaged units to their prewar efficiency, despite makeshift repair facilities.

## Creole's Output Down To 555,393 Bbl. Daily

CREOLE PEROLEUM CORP.'s daily average production of crude oil during May dropped to 555,393 bbl., compared with 574,522 bbl. for April, and the alltime high of 599,192 bbl. daily for February. Daily refinery runs also showed a decrease, being 59,538 bbl. for May, compared with 61,981 bbl. in April.

Of the total May production, Creole took 405,092 bbl. daily from Lake Maracaibo area and Cumarebo and the remaining 150,301 bbl. from Eastern Venezuela. Daily refinery runs showed 50,146 at the Caripito refinery and 9,392 at La Salina.

Sixteen development wells were completed, all oil producers. Of four wildcats, two were oil producers, one a gas well in Mulata field which had not been tested as of last week but which was at a depth of 6,309 ft., and one a dry hole (QGE-34) in the Quiriquire area at about 3,724 ft.

The fields where the 16 development wells were completed, their average initial production, and average depth follow:

Bolivar Coastal (B.C.F.), nine, 698 bbl., 4,218 ft.; Mulata, three, 337 bbl., 5,412 ft.; Quiriquire, two, 439 bbl., 4,063 ft.; Jusepin, one, 380 bbl., 4,110 ft.; and San Joaquin, one, 338 bbl., 5,220 ft.

In the Jusepin area, one wildcat was brought in at 3,804 ft. and showed an average initial production of 291 bbl. Another wildcat, in the Quiriquire area, showed an average initial production of 483 bbl. at 3,724 ft.

A wildcat in West Lake field, VL-1, is being drilled by Creole for Shell.

# Two Agreements Possible to Handle Future I.P.C. Production

*by Warren W. Burns*

WHILE Iraq Petroleum Co., Ltd.'s new contract has not been finalized, due to the reluctance of C. S. Gulbenkian, the 5 per cent partner, to sign, several new developments in the Middle East oil situation have come to light. Notable among them is that the French partner in I.P.C. Cie. Francaise des Petroles, is so satisfied with the rewritten contract that it has offered to withdraw legal objections filed in the British courts.

However, both Standard Oil Co. (N.J.) and Socony-Vacuum Oil Co., Inc., the two partners which hold a joint I.P.C. partnership through the Near East Development Corp. and against which Cie. Francaise filed a protest, objecting to the entry of these two United States oil companies into a partnership agreement with Arabian American Oil Co., have specifically requested Cie. Francaise not to drop the suit. The reason for this is that if Gulbenkian declines to agree to the terms offered by Jersey Standard and Socony-Vacuum, a declaratory judgment will be sought in Great Britain, although both United States oil companies would prefer to settle the dispute amicably.

In 1928, Gulbenkian insisted upon a separate agreement with Cie. Francaise whereby he could either take his share of Iraq's crude and sell it on the open market, or, if he could not get a better price, Cie. Francaise would be forced to purchase it. Cie. Francaise agreed, and as matters have since developed it has never been a hardship on the French as they badly needed the crude.

### Gulbenkian's Position

Now, it is reported, Gulbenkian is withholding his signature to the new agreement because he wishes, among other provisions, all I.P.C. partners to agree today to what Cie. Francaise agreed to in 1928. All four major I.P.C. partners, moreover, are willing to go along. In short, Gulbenkian would be permitted to take his 5 per cent of I.P.C. production and sell it on the open market at the highest price. Or if he did not wish to do so, the other partners would agree to purchase it from him at a slightly lower price. But more than this, the major I.P.C. partners have agreed to put Gulbenkian on an equal basis in deciding policy.

However, Gulbenkian also insists, and herein lies the disagreement, that he be allowed to call for more crude-oil production at any time and that he be permitted to handle it in the same manner. To this the partners object, for it is readily conceded that within a few years the present tight world-wide crude-oil situation will not exist, and at that time I.P.C. partners might well find themselves with more crude oil than they could use. It was pointed out that if Gulbenkian were allowed to increase I. P.C.'s production that his share would be only 5 per cent, but that the other partners would each be getting 25.75 per cent more which might well be over the market demand.

In fact, the proposed new contract covers the supply situation in such a manner that two agreements have been suggested, one for the 1952-1956 period and the other for 1957-1961. In the 1952-1956 agreement, each partner is to table the amount of crude needed for this period. The partner, or partners, which get more than their pro rata share will agree to pay the partner, or partners, taking less a certain premium. The 1952-1956 commitments would be definite. The 1957-1962 commitments would be tentative and would not be binding until a later date when the partners again discuss needs. Cie. Francaise is expected to get a greater share than the other companies, at least for the 1952-1957 period.

A copy of the proposed I.P.C. contract has been filed with the U. S. State Department where no opposition is expected since the restrictive "Red Line" clause has been omitted.

## Socony-Vacuum Planning To Increase Guico Output

Although daily potential capacity of the 103-mile, 12-in. pipe line, now being completed between Venezuela's Guico field to a tanker loading terminal at Guanta, will be 70,000 bbl., Socony-Vacuum Oil Co., Inc., builder of the line, explains that crude-oil production in Guico is now only 23,500 bbl. daily.

However, company officials explain they expect to increase the 46 producing wells in Guico with a consequent increase in production.

Crude oil for United States refineries started flowing through the first 40-mile section of this line last week. And until the remainder of line is completed — probably early next month — Socony-Vacuum is relaying the crude at Anaco to the tanker loading terminal by use of the Mene Grande Oil Co.'s pipe line. Williams Brothers Co. is building the Socony-Vacuum line. Socony-Vacuum's Venezuelan subsidiary is Socony-Vacuum Oil Co. of Venezuela, of which Robert Siegel is president.

## Standard-Vacuum Foreign Group Completes Training

Completion of a program designed to make 17 war veterans from West Coast U. S. colleges and one Hollander aware of their responsibilities as United States representatives in foreign countries, has been announced by Standard-Vacuum Oil Co. These men will leave shortly for sales positions in India, China, Japan, Netherlands East Indies, Malaya, Siam, and the Philippines.

Sixty colleges and universities submitted applicants for the eighth class Standard-Vacuum has trained since termination of the war. Altogether 86 trainees have finished the course, 76 of them former servicemen.

## Five Tests Started in British Zone in Germany

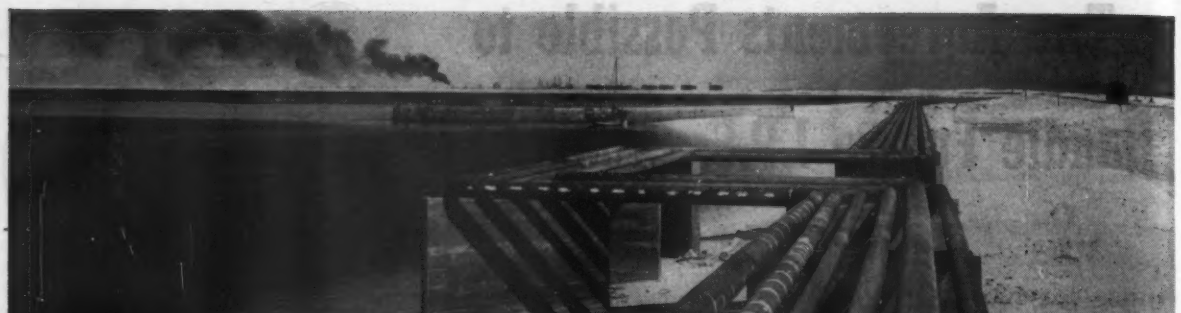
Drilling operations on five tests are now under way in the Zwischenahner district of Oldenburg, in the British Zone in Germany, according to a dispatch through Reuters from Dena, the German news agency.

Drilling started after favorable geological reports regarding a possible oil-bearing strata in this area, located about 34 miles from Bremen.

Crude-oil production in Germany is concentrated largely in the British zone where approximate output last year was 12,600 bbl. daily. Production in the United States zone of occupation in 1946 was only about 95 bbl. daily. However, total German crude-oil production was up last year compared with 1945 when the daily output was reported at approximately 10,000 bbl.

### Colon Development Production

Venezuelan crude-oil production of Colon Development Co., Ltd. (Shell), for the 4 weeks ending June 30 was 364,997 bbl. (approximately 13,035 bbl. daily) compared with 476,762 bbl. (approximately 13,764 bbl. daily) for the 5-week period ending June 2.



*These lines deliver refinery products from the refinery at Ras Tanura to a marine loading terminal in the Saudi Arabian concessions of Arabian American Oil Co.*

# Vast Area in Middle East Awaiting Exploration and Development

***by F. Julius Fohs***

International
WORLDWIDE OIL DEVELOPMENTS

THE oil deposits of the Middle East are among the world's greatest. Hence, the struggle for control by nations and corporations for this most immediate and cheapest form of industrial and military mobile power is to be expected.

To understand something of the conditions of the occurrence of these oil deposits, it is desirable to outline as simply as possible something of the geology of the region. The principal controlling elements are (1) the Arabian foreland, a stable block of granite and ancient sedimentaries; (2) the Asiatic Alpine mountain uplift of the Zagros-Taurus Mountains and Oman Mountains; (3) a great downwarp or sedimentary basin in which great thicknesses of shales, sands, and limestones have been deposited with sediments 20,000 to 30,000 ft. thick. These create source beds for oil and gas, and cover to prevent escape. The shifting of the Alpine arc southwest toward the rigid Arabian foreland created anticlinal folds of the sedimentary beds, the folds and particularly domal portions, becoming loci of the oil deposits. Such folds occur paralleling the mountain axis, both west of the mountains and in the great synclinal or downwarp basin or valley in which the Tigres-Euphrates rivers flow, and which is similar to the Mississippi River Valley embayment, but is three times as large. The sedimentary beds range in age from recent to Cretaceous or below. Most of the oil production is in Tertiary (Eocene-Miocene) and Cretaceous limestones and some sandstones. In the deeper portions of the basin, in southwest Iran and in the Persian Gulf, many salt domes have been found. On the west side of the Oman range a series of anticlines are worthy of development in line with Abqaiq.

**This article is an abridgement of material originally prepared by F. Julius Fohs, who is widely known as a consulting geologist and engineer. In it, he discusses several aspects of Middle East oil, including the geology of the area and some economic problems involved in the development. Fohs has been active in the petroleum industry 33 years. At one time he was associated with the Col. A. E. Humphreys-Fohs companies and later operated as Fohs Oil Co. and affiliates. He is a former director and vice president of the American Institute of Mining and Metallurgical Engineer. In 1943, he completed geological reports on Palestine, Trans-Jordan, Syria, and Iraq with revisions last year. In 1919, he made a detailed study of Palestine's natural resources and was a consultant on irrigation projects.**

### Area of Oil Importance

The important oil deposits occur in northeast Iraq, extreme western Iran, and eastern Arabia, and will extend slightly into Turkey and Syria. The anticlinal folds further west in Syria, Lebanon, Trans-Jordan, and Palestine are principally in limestone beds which lack the sealing cover necessary to retain important oil accumulations, though some development is being done in Palestine where near Gaza and in the south, there is somewhat more cover. A separate mountain system in southern Arabia, because of igneous intrusions, has probably little or no value for oil prospecting.

In the primary oil-reserve area of Saudi Arabia, I estimate 221,000 sq. miles with a westward secondary area of 100,000 sq. miles almost unexplored. Another 90,000 sq. miles having much lower oil possibilities lie

to the west; this zone flanks and overlaps the Arabian foreland on the east with beds dipping eastward. However, the primary area is so great and will require such large capital and so much time to develop that it will be some time before the remainder is prospected.

Between the Zagros and Elburz mountains to the northeast, we find sedimentary basins of lesser value for oil and gas. The best of these is in northern Iran and southwest Afghanistan, and covers an area of 175,000 sq. miles having domes with Cretaceous beds at the surface—some less apparent than others—with occasional igneous flows. This basin is of uneven value and almost wholly unexplored as well as difficult of access both for exploration and pipe lines. That it will ultimately yield pools of the Rocky Mountain type, I have no doubt. A small portion of it is included in the Russian concession (actually not yet ratified by the Iranian Government) that extends south and east of Teheran. It was studied by the late Dr. Frederick Clapp and others.

Southward in Iran, of less importance, are the Kerman and South Iranian basins, and to the east the Central Baluchistan basin, totaling 97,500 sq. miles. All three basins are almost unexplored but have oil possibilities.

Along the Oman Gulf shore of Iran and the Arabian Gulf shore of Baluchistan, is the eastward continuation of the Persian Gulf basin with 52,000 sq. miles of primary possibilities.

### Estimates of Reserves

Reserve values of the primary Persian Gulf province vary greatly in different parts of the area; thus the northern two-thirds of the British area in Iran, and a strip 50 miles wide in eastern Iran are ultrarich, as is the strip in Saudi Arabia, etc., on the west coast of the Persian Gulf from Trucial Oman north. From 250 to 2,500 ft. of oil saturated limestones have been penetrated in the Iraq-Iran fields.

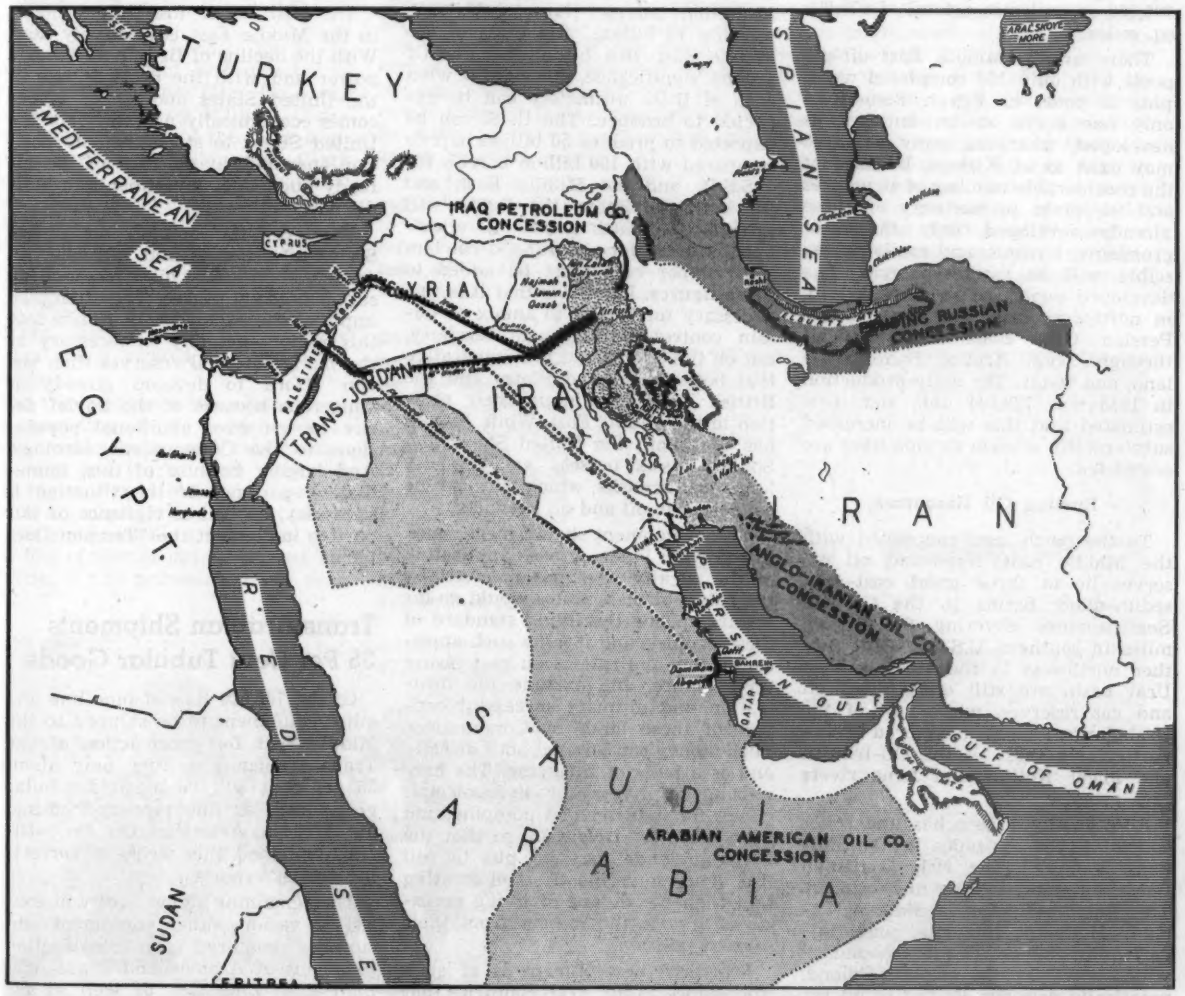
Turkey's oil territory is small, chiefly in the Ardahan province which Russia claims.

## International

WORLD-WIDE OIL DEVELOPMENTS

The proved reserves of the Middle East are only a fraction of those to be developed. E. DeGolyer, internationally known geologist, has reported that there are 16 billion barrels of proven reserves in the Persian Gulf basin and that there is an indicated reserve of 26½ billion barrels. It is not unreasonable to expect 100 billion barrels ultimately. Both Joseph Pogue, vice president of Chase National Bank and an oil authority, and L. F. McCollum, coordinator of producing activities, Standard Oil Co. (N.J.) estimate 150 billion barrels for this area.

On the north flank of the Elburz Mountains are promising folds. It is probably these that Russia is seeking in her effort to obtain a concession in northern Iran. And while the land area covered is only a narrow strip on its south shore, it does spread to




*This map shows principal features of oil interest in the Middle East and a part of southwest Russia*

the west at Resht and to the east, south of the Soviet oil field, Chikishlar, and into the Caspian, forming part of the Baku sedimentary basin.

### Ownership of Reserves

Ownership of Middle East primary exploitable reserve areas is divided in square miles approximately as follows: American companies 292,000; British-Dutch 233,000; French 37,500; C. S. Gulbenkian and associates 7,900; Turkey 21,500; and a small area in northern Iran which may eventually be controlled by Soviet Russia. On basis of control, however, Britain has 318,500 sq. miles as against 252,000 sq. miles under American control. In addition, there are sizable second and third class areas.

Summarizing, the Middle East, has primary reserve areas totaling 649,000 sq. miles, secondary areas of 131,000 sq.miles and tertiary grade areas of 195,000 sq. miles in a total of 975,000 sq. miles.

There are 20 Middle East oil-gas pools with only 150 completed wells, plus 3 pools in Egypt. Sometimes only one dome on an anticline is developed, where as many as three may exist as at Kirkuk. Because of the considerable number of structures and the great productivity of those already developed, only the most promising, obvious, and easily accessible will be exploited soon. The developed pools are in eastern Iraq, in northwest Iran, and close to the Persian Gulf coast from Kuwait through Saudi Arabia, Bahrein Island, and Qatar. The daily production in 1946 was 729,041 bbl., and it is estimated that this will be increased substantially as soon as pipe lines are completed.

### Russian Oil Resources

To the north, and contrasted with the Middle East, important oil reserves lie in three great east-west sedimentary basins in the Caspian Sea province covering 946,000 sq. miles in southern U.S.S.R. Still further northwest in the Moscow-West Ural basin are still other great oil and gas reserves, while east of the Urals large, almost unexplored basins, particularly those of the Ob-Irkutsh and lower Kolima and Lena rivers give promise.

Additionally Russia has under her control 99,000 sq. miles in the Balkans, including the rich Romanian fields, but most largely undeveloped. The Russian-dominated Balkans include Hungary, Romania, and Bulgaria, plus Poland. The new boundary which gave Russia eastern Poland, practically denuded Poland of oil reserves, and added its sub-Carpathian deposits directly into the Russian column.

Likewise in Soviet Russia, development has been restricted principally to a few areas, and only those of Baku, Grozny, and Maikop have yielded oil in quantity, but now the prolific Devonian pools on the southwest flank of the Urals must be added. Russian production in 1946 inclusive of Sakhalin was estimated at 454,794 bbl. daily but may have been greater. Additional Russian controlled production is about 120,289 bbl., giving Russia a total of 575,085 bbl. daily.

Both the Middle East and Soviet Russia will require large capital for extensive oil development together with much well equipment and pipe. For the Middle East, American, British-Dutch, and to some extent French, but principally American capital, will be available. Huge sums of money and large amounts of equipment will be required from the United States for many years to come.

### Ultimate Production Compared

The present proved oil reserves of the United States are approximately 22 billion barrels; those of U.S.S.R. possibly 10 billion; and those of the Middle East 16.5 billion barrels. Of greater significance, however, is what each of these ultimately can be expected to produce. The U. S. can be expected to produce 50 billion barrels compared with 100 billion barrels for U.S.S.R. and the Middle East, and for both the latter, the figure will probably be much greater. If allowance is made for natural-gas conversion 50 per cent must be added to these figures. It follows that it is unnecessary for Russia to annex or obtain control of additional territory, but on the other hand it is imperative that both the United States and the British Empire maintain their position in the Middle East. While Britain has coal, both the United States and Soviet Russia possess exceptionally large coal deposits, which later can be converted to oil and oil products.

Oil development should mean much to the Arab lands. A wise application of the royalty revenues received by the rulers of these states would go far toward raising the living standard of these peoples, and it is by such application that the rulers can best insure their tenure, and exclude the infiltration and ultimate successful capture of these lands by Communism. Such money can be used both directly and as a basis of financing. The harnessing of rivers for hydroelectric power for industry and pumping, and even more for irrigation, so that the irrigable lands may be put to full use, would have the effect of creating that higher standard of living necessary to raise the masses from their present position.

Economic development is of such importance to the Arab countries that with the fair oil royalties already assured by the operators, it is good business for both Arab leaders and the Arab fellahs to realize the benefits bestowed. The oil companies are employing many Arabs in this development, and establishment of more training schools by the companies will be a worthwhile undertaking.

### Equipment Russia's Need

We have shown clearly that Russia has ample oil reserves for development within her borders or under her control, enough in fact to make Middle East oil holdings unnecessary. What Russia lacks principally is available capital as well as machinery and machine tools.

If Russia obtains the coveted northern Iranian oil concession she will be in a position to complete her hold on Baku basin reserves and also to use this area as a strategic base to protect the Caspian sea with its great oil-gas reserves. Russia's attempt to obtain the mineral resources of the Kars area of Armenian Turkey is part of her imperialistic expansion program as is that of the Ardahan Province with its small share of Persian Gulf oil.

The position of the United States in the Middle East is relatively new. With the decline of Britain as a world power and with the postwar rise of the United States and Russia it becomes economically necessary for the United States to strengthen its position—particularly in view of the already huge U. S. investments in Middle East oil.

Whatever the opinion on United States oil reserves and ultimate recovery, Middle East oil offers a cheap supplementary source. The attempted imperialistic expansion of Russia into this region—actually unnecessary as she has greater oil reserves than she can afford to develop already—is dangerous because of the Soviet desire to win over additional populations to the Communistic ideology. And largely because of this, immediate cognizance of the situation is necessary, as well as vigilance on our part to implement the "Truman Doctrine."

## Trans-Arabian Shipments 35 Per Cent Tubular Goods

Of the 700,000 tons of pipe line and other equipment to be shipped to the Middle East for construction of the Trans-Arabian pipe line, only about 35 per cent will be oil-field tubular goods such as line pipe and casing, an Arabian American Oil Co. official explained this week in correcting earlier reports.

The remaining 65 per cent will consist of various other equipment and supplies required for construction programs of Aramco and Trans-Arabian Pipe Line Co., as well as for maintenance of existing facilities.

# Ground Reconnaissance of Arabian Pipe-Line Route Completed

**by Paul Reed**

COMPRISING the first expedition to travel on the ground across the vast desert subcontinent of Arabia, an 11-day reconnaissance survey was recently completed by a pipeline party of seven American engineers along the proposed route to be followed by the Trans-Arabian Pipe Line Co.'s project. The initial terminal of the pipe line is to be located at Abqaiq near the Persian Gulf. The line will be built in a northwesterly direction across Arabia and will terminate on the Mediterranean Sea. The purpose of the journey was to establish control points and to get a preliminary view on the ground of the conditions under which the pipe line would be laid.

The party was headed by H. H. Hall, vice president and director of Trans-Arabian Pipe Line Co., who was accompanied by William Chandler, chief engineer of the same company; Ray L. Hamilton and Clark Rankin, of Bechtel International Corp.; Ford Bartlett and George McDonald, of Compania Bartlett, S.A., contractors for the actual ground survey; Lloyd Owen, of Arabian American Oil Co., geological department. With the party were two Arabian soldiers and several natives who pitched camp, cooked, and drove the trucks.

The trip was made in a motor caravan consisting of two sedan automobiles, two pickups, and two trucks. The cars and trucks were equipped with big sand tires inflated with from 8 to 25 lb. of air. It is a tribute to the rugged construction of American tires that out of the 24 spares carried for the trip, it was necessary to use only five.

During the 1,100-mile journey of the reconnaissance party, the climate was found to be very comfortable. The temperature during the day rose to 90° and dropped at night to 45°. A tent was set up for cooking and eating. The party slept in sleeping bags on army cots. The schedule of the party was to start at daylight and make camp the next night before dark.

### Compass Course Followed

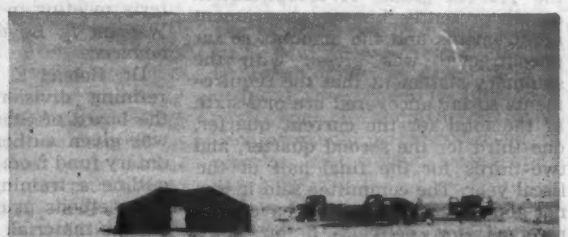
Since the party was traversing a wild desert without permanent habitations, it was necessary to take all needed supplies, including water to last the entire 11 days, as there was no way to replenish with clean water from wells along the route. A compass course was followed the entire way. Occasionally, the party found camel trails or a rare auto trail, but for most of the route it struck out across the open desert.

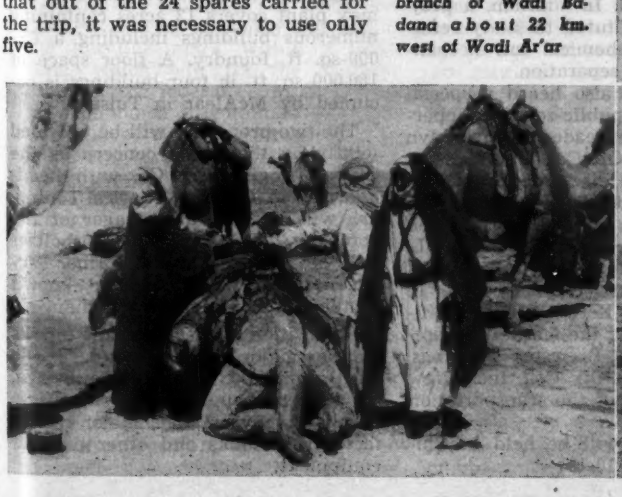
The few wandering tribes of Arabs encountered in the desert were found to live on a diet consisting of only coffee, rice, dates, camel meat, mutton, and milk from their animals. Wild game includes gazelles, Arabian foxes, and several kinds of birds. No census of the population of this area has been taken beyond the enumeration of 100,000 camels and 200,000 sheep.

Although parts of the American deserts of Texas, Arizona, and California have conditions comparable to those encountered in Arabia, there is an unusual type of terrain in Arabia where there are hundreds of miles of rocky ground completely denuded of all soil. The traversing of this bare, rocky ground presents new problems to pipe-line workers.

Previously, several reconnaissance trips have been made along the Trans-Arabian pipe-line route by airplane.

*Right: Desert camp of motor caravan. The tent was used for cooking and eating. The party slept in sleeping bags on army cots. Lower left: a scene on the trip—loading water bags on camels. Lower right: gassing up in branch of Wadi Badana about 22 km. west of Wadi Ar'ar*





## Gulf Affiliate to Test Salt Dome in Jutland

Danish American Prospecting Co., an affiliate of Gulf Oil Corp., is reported to have spudded in its first oil test near Holstebro, Jutland.

Before and since the war, Danish American—which holds an exclusive concession for mineral exploration rights in Denmark—drilled numerous salt wells from 1,800 to 2,000 ft. The drilling scheduled for July will be the first strictly oil operation and will test one of the deep salt domes. A deep-test rotary rig will be used.

Last December a wildcat well in southwest Sweden showed some oil saturation in the bottom of the hole. However, the well was finished in a salt-water sand, and current plans are going ahead for the establishment of a salt plant in that area.

# New, Higher U. S. Requirements Presented to NPC

WASHINGTON.—Problems of military requirements for petroleum products and supplying the huge civilian demand occupied the full time of the National Petroleum Council at its quarterly meeting here July 10.

Reports of committees on various phases of the problem, many of them made public during the past few weeks, were presented and discussed, but little information not already well known to the industry was brought out except that government requirements for the coming fiscal year will be higher than indicated in the earlier report of the council's committee on the subject.

Officials of the Army, Navy, and Bureau of Federal Supply attended the session and renewed their pleas that the industry cover their bids and again offered to make any reasonable changes in specifications and procurement procedure which might make it easier to obtain supplies. Council members answered that government needs must and will be met, but no guarantees were given.

The committee on government requirements reported that in the month since it made its original report the needs have increased 533,000 bbl. per month of motor gasoline for overseas areas, and 324,000 bbl. of aviation gasoline per quarter, chiefly the 115-145 grade. A recapitulation of all presently known government requirements and the amounts so far uncontracted was given, with the summary statement that the requirements so far uncovered are one-sixth of the total for the current quarter, one-third for the second quarter, and two-thirds for the final half of the fiscal year. The committee said it was not alarming that few bids have been received for delivery 6 or more months hence. General satisfaction was expressed that 500,000 bbl. per month of Navy Special fuel oil would be imported from Arabia during the next 6 months to build up emergency reserve storage on the East Coast.

### Lack of Transportation

The committee on petroleum production and crude availability reported that actual production of 5,106,538 bbl. per day is the maximum available in the United States except for 128,750 bbl. per day in Texas, and 30,285 bbl. per day in Colorado and Wyoming which cannot presently be utilized because of lack of transportation facilities.

The committee on petroleum transportation facilities presented a brief report which declared that the oil industry is doing everything possible to expand facilities within the limits of available steel. Separate committees on individual transportation facilities had published their detailed reports earlier with the exception of the pipe-line committee, which reported to the council that pipe lines were adequate for all needs prior to the war and that projects already announced and planned will meet the existing requirements, principally outlets for West Texas crude and greater deliveries from the Gulf Coast and Mid-Continent areas into Midwest refining centers.

A supplemental report of the committee on tank-car transportation reaffirmed the need for 4,000 new high-pressure tank cars and 7,500 regular oil tank cars, and urged that 18,000 tons of steel plate and forms per month be allocated to tank-car builders to permit them to operate at their capacity of 900 cars per month. The committe estimated that 30,000 tank cars will be retired from service during the next 5 years, and said steps must be taken at once to provide replacements.

### Materials Report Not Adopted

The only report not adopted by the council was that from the committee on materials. This was discussed at some length by visiting officials from the departments of State and Commerce, following which the council deferred action until the next meeting. The explanation doubtless was the criticism of government export policy, first made by the committee in January and repeated in its report released last month. This asked the Government to stop diverting scarce industrial materials to foreign governments and revise the export-control system so that exports of oil industry materials would go almost exclusively to American oil companies operating abroad. The report also demanded that the Government defer construction of public works until present shortages are relieved and that it adopt effective labor legislation to prevent strikes. Under a new export-control law just passed by Congress the administration is revising its export policy and regulations, and presumably the council was asked to suspend judgement until the new procedure has been given a trial.

## A.P.I. Board Authorizes Refinery Research Study

Two refinery research projects were authorized by the American Petroleum Institute directors at their quarterly meeting in Washington July 11, William R. Boyd, Jr., president, announced.

Dr. Robert E. Wilson, head of the refining division and chairman of the board of Standard Oil Co. (Ind.), was given authority to solicit a voluntary fund from Institute members to outline a training program in refinery methods using films, charts, and similar material. In addition, a project will be instituted to study refinery waste and chemical and mechanical methods of separation.

The directors also heard a special report of the public-relations operating committee headed by Franklyn Waltman, Sun Oil Co., Philadelphia. This report was discussed in connection with current talk of shortages and military needs. Other reports given at the meeting were from Jake L. Hamon, Cox & Hamon, Dallas, head of the production committee; B. L. Majewski, Deep Rock Oil Corp., Chicago, chairman of the marketing committee; and B. Brewster Jennings, Socony-Vacuum Oil Co., Inc., New York, chairman of the transportation committee.

Next session will be held in Chicago, November 10-13.

## A. J. Smith Engineering Buys McAlear, Climax

In a reported $4,500,000 transaction, A. J. Smith Engineering Co., Kansas City, Mo., has purchased McAlear Manufacturing Co., Tulsa, and Climax Engineering Co., Clinton, Iowa, both divisions of General Finance Corp., Chicago.

The McAlear company manufactures control equipment for liquids, vapors, and gases while Climax makes a complete line of oil-field engines, farm machinery, electric fans, lighting plants, and fluid pumps. The Climax plant covers 12 acres containing numerous buildings including a 65,000-sq. ft. foundry. A floor space of 180,000 sq. ft. in four buildings is occupied by McAlear in Tulsa.

The two properties will be operated jointly by the Smith concern as the Climax Engineering Co. with headquarters in Clinton. Charles Tonkin, Jr., will be general manager of the company. William A. Oberholtzer will be manager of the former McAlear plant, which will be known as the controls division of Climax.

Acquisition of the two plants marks another major expansion step for the Smith company. Eighteen months ago, the concern bought control of Black, Sivalls & Bryson, Inc., major manufacturer of tanks and other oil-field equipment.

# WASHINGTON WATCHING

BY HENRY D. RALPH

## "Tidelands" Agreement

WASHINGTON.—Some sort of temporary working agreement as to the status of oil production from submerged lands off the California coast is understood to have been reached after a long series of closed conferences between officials of the Department of Justice and representatives of California, the municipalities affected, and the oil companies now operating there under state leases.

Most of the West Coast men left Washington last weekend and it was reported that final details were being worked out and that a stipulation would be circulated for signature within a day or two. However, it was not expected that the agreement would be announced until the White House sends a message to Congress asking for interim legislation.

It is believed that no final agreement has been reached on any of the many problems raised by the Supreme Court's decision that the ocean bed and its oil below the low-tide mark are the property of the federal Government rather than the state. California probably will file a petition for reopening and reargument of the case at the fall term, and so is not likely to prejudice its position by making any concessions at this time. Also, the court requested the state and federal governments to submit proposed drafts of a decree by September 15, which will involve much more legal sparring.

However, it was recognized by all that there must be some sort of "modus vivendi" for the present, regardless of the ultimate settlement of the various issues, since the oil is needed, the wells are producing, and royalties are accruing. The Coast and Geodetic Survey probably can define the low-tide mark within a short time, which will fix the in-shore limits of the federal claim, but there may be much litigation to establish whether or not some or all of the wells are within the limits of a bay or harbor and therefore not on federal property.

## Senator O'Daniel Speaks

UNEQUIVOCAL notice that the Senate is in for a fight over ratification of the Anglo-American petroleum treaty was served last week by Sen. W. Lee O'Daniel of Texas.

Opening with the statement that the administration, "having failed to completely accomplish the dastardly task" of nationalizing and controlling the oil industry, has now enlisted the aid of England "to help nationalize and degenerate this nation by means of a so-called petroleum agreement," he assured the Senate that when ratification is brought up the treaty "will have the uncompromising opposition of the junior senator from Texas."

"We developed our oil business in Texas without any help or advice from the United States Government and without the help or advice of Great Britain. We do not care to have either of these nations try to stick their noses into the internal affairs of our sovereign state at this time," he said, adding, "Now that the war is over, if the administration in Washington thinks it can keep on cramming insults down the throat of Texas by trying to turn us back to the royal crown via the treaty system, it will be found that, so far as I am concerned, we have not yet started to fight."

## Tank-Car Disposal

THE battle over control of the Government's surplus high-pressure tank cars has entered a new phase but is not yet ended.

War Assets Administration has offered for sale 422 propane cars at the fixed price of $6,484 each, but subject to the requirement that they be kept in L.P.G. service for at least 1 year. The sale is also subject to the allocation order of the Office of Defense Transportation.

For several months WAA and ODT have been feuding over control of these cars. WAA leased them to various L.P.G. shippers and proposed to offer them for sale, but ODT insisted it had the right to control them. Last spring ODT issued an order requiring certain shippers to give up certain cars and transferring the leases to other L.P.G. shippers. The life of ODT was scheduled to expire March 31, then June 30, then July 15, which made the continuance of the allocation order a bit uncertain. Now, however, Congress has continued ODT until February 29, 1948, so presumably the allocation order will stand unless the new purchasers care to challenge its legality. If the orders remain in effect the new owners will have to lease the cars to shippers determined by ODT.

Purchase orders will be received by WAA up to August 4, and may be submitted by priority claimants, including veterans, and by nonpriority purchasers.

## Synthetic-Rubber Policy

PERMANENT legislation to maintain a synthetic-rubber industry in the United States will be one of the first orders of business at the January session of Congress, the House armed services committee has announced.

The committee had hoped to prepare a bill before adjournment, but the Army-Navy Munitions Board only last week presented its recommendations. These have not yet been made public, but the committee quickly decided that they do not represent a substantial majority of the opinions of affected industries and that extensive hearings must be held. These will be held in the fall, and the committee promises to go thoroughly into the problems of producing butadiene and synthetic rubber.

The present disposition of the committee is to sponsor legislation which will require fabricators to use a certain amount of synthetic rubber along with natural. This will provide an outlet for the minimum amount of synthetic which the military authorities feel is required as a safeguard against any future emergency which would shut off access to natural.

## Export Controls on Pipe

EXPORT controls have been extended to February 29, 1948, by a revised bill agreed to July 11 by both House and Senate, and simultaneously the Commerce Department announced that, effective July 15, exports controls requiring individual licenses would be imposed on both seamless and welded casing and oil line pipe.

Both chambers had passed measures extending export-control authority in different forms and for different lengths of time, and the new law is a compromise of the two. It specifically lists petroleum and petroleum products among the commodities for which export licenses may be required.

The new law also continues authority for the Commerce and State departments to issue priorities and allocation orders for the export of articles necessary for carrying out the foreign policy of the United States, but only after a finding that such export will not have an unduly adverse effect on the domestic economy.

The authority of the Office of Defense Transportation to allocate and control the use of transportation equipment by rail carriers is also continued until February 29.

# Holman, Hallanan Show Industry's Position at House Hearing

WASHINGTON. — The record demand for petroleum products will be met by the oil industry except possibly for minor local shortages of brief duration, the House committee on interstate commerce was assured lasf week by two leaders of the industry, Eugene Holman, president of Standard Oil Co. (N. J.), and Walter S. Hallanan, chairman of the National Petroleum Council.

Except for an executive session with military officials to hear of industrial mobilization plans being prepared in case of another emergency, the committee has closed its current investigation of the petroleum situation.

Both oil executives said that no government measures are necessary or desirable to prevent a shortage to consumers except any steps which might be taken to provide the oil industry with more steel to expand its facilities, such as a tighter restriction on exports of oil-industry tubular goods and line pipe.

Holman outlined the world oil picture and the long-range trends in the petroleum industry, while Hallanan explained the current demand and the steps which the industry is taking to meet it. B. A. Hardy, president of the Independent Petroleum Association of America, also testified, giving the committee a summary of the report presented to the National Petroleum Council by his committee on crude production and availability.

**Optimistic Long-Range View**

Holman said: "Nowhere abroad—as far as I know—is there a surplus of oil today . . . a cut in United States exports would almost demand that imports also be cut to make minimum needs available to oil-starved Europe. From what I know of the situation in western Europe, the results of reducing the present supply of oil products could well be calamitous. Europe is today, as never before, depending on oil as an energy supply. Coal, the old standby, has failed to meet even prewar output. Rationing of oil products is still prevalent in western Europe and if oil supplies were seriously curtailed a real breakdown would occur with all that it implies in this difficult period of reconstruction."

Holman was optimistic with regards to the long-range prospects of adequate oil supplies. He continued, "I am convinced that there is no need for concern regarding this country's long-range supply of raw material for oil products. To begin with, there is still a great amount of crude oil to be found in this country—perhaps at least as much as has already been found. . . . Two basic additional sources are available for this purpose, when and if they are needed. The first of these is imports from foreign countries. . . . The second basic additional source of supply is the manufacture of liquid oil products from materials other than natural petroleum."

Explaining current record demand, Hallanan told the committee, "the problem facing the oil industry is not essentially one of shortage, but it is to find means to get the right product to the right place at the right time. We have the oil at the wells and we have sufficient refining capacity to turn out the products—the real problem is to get the products where the consumer wants them. From a standpoint of supply and demand the situation is tight, but it is not one that should create any degree of panic."

# Jennings Discusses Foreign Petroleum Costs Before Senate Group

WASHINGTON.—The industry's ability to supply domestic petroleum and relative costs of production of United States and foreign oil appeared to be the chief subjects of interest to the economic resources subcommittee of the Senate public lands committee as hearings opened July 14 in the petroleum phase of its months-long resources study.

Chairman George Malone, of Nevada, announced that the group intends to develop all the facts relating to both the current and the long-range petroleum situation, both domestic and world-wide. The study is, in effect, a continuation of the investigation made during the war by the special petroleum committee headed by Senator O'Mahoney, of Wyoming, who is a member of this subcommittee.

The first witness, Max W. Ball, of the Oil and Gas Division, gave a brief outline of the situation, and was asked to prepare many charts and statistics for the committee records. He denied the popular impression that the war had cut deeply into our petroleum supply by showing that the trend of demand has been rather steadily upward, war or no war, and probably will continue to increase at about the same rate to 6,000,000 bbl. per day by 1951. The current trouble, he said, is because the oil industry is trying to do a 1947 job with a 1941 plant, and we are not yet a have-not nation as regards petroleum.

B. Brewster Jennings, president of Socony-Vacuum Oil Co., Inc., said that given ample supplies of drilling and production equipment and the necessary capital, the industry will develop enough new oil to meet certainly the major portion of domestic demands. Foreign and domestic production costs are very difficult to ascertain and compare, Jennings said, but United States oil is more expensive to produce than Venezuelan and both are more costly than Middle East oil, but costs of transportation and problems of recovery of capital are in the reverse order, so over a period of time there will not be much difference in the cost of foreign and domestic oil delivered to United States markets.

## Interim Arrangement Made On "Tidelands" Royalties

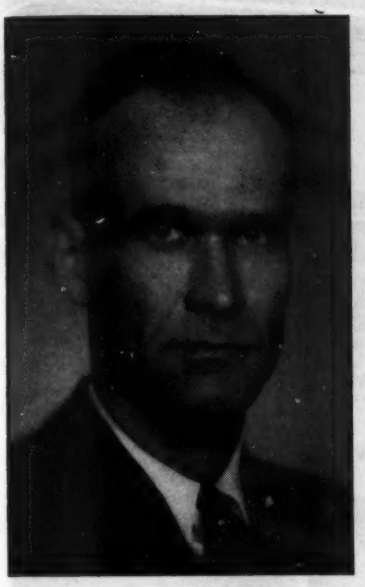
Some of the details for interim administration of submerged lands off California's coast which were affected by the Supreme Court's recent "tidelands" decision were revealed this week in California's capital at Sacramento.

Royalty payments and other transactions affecting the area will continue as usual until Congress arranges for federal administration, according to James S. Dean, state finance director, who returned from conferences in Washington with federal officials.

The royalties will still be paid to the state but the money will be held in reserve pending final settlement of the case. This was provided in agreements signed in Washington between state Attorney-General Fred N. Howser and Justice Department officials.

"An act must be passed giving jurisdiction to the Interior Department or some other agency unless, of course, Congress gives title back to the states on a quit-claim basis," Dean said *(for other reports on "tidelands" administration, see Watching Washington, page 51).*

# PERSONALS



## Langfitt Began Career At Marcus Hook Plant

J PORTER LANGFITT, who was made vice president for refining of Pure Oil Co. in the company's recent executive reorganization, is a 45-year-old West Virginia native with 22 years' service in the Pure organization.

After graduation from high school at Parkersburg, W. Va., he attended Mercersburg Academy and Lehigh University where he received A.B. and mechanical engineering degrees.

He joined Pure at the refinery which the company then operated at Marcus Hook, Pa. His first job was as a laborer. He rose rapidly in the organization, becoming construction engineer and later stillman.

Langfitt was subsequently transferred to Chicago headquarters and acquired a wide familiarity with company operations working out of Chicago as an engineer in the distillation and process departments. He was made assistant to the vice president in charge of refineries in 1937. His election as vice president came April 26.

**James H. Kelly,** fellow at the Institute of Gas Technology, Chicago, and formerly with Standard Oil Co. of New Jersey at Baton Rouge, La., is working this summer with Colorado Interstate Gas Co. in fulfillment of the institute's curriculum requirements. Other institute fellows include: **Willard M. Dow,** working at the institute on research in the transfer of heat in beds of fluidized solids; **Douglas S. Chapin,** with the National Bureau of Standards on gas-analysis research sponsored by the American Gas Association; **Eugene H. Luntey,** working at the institute on research in the influence of particle characteristics on the behavior of a column of fluidized solids; and **William J. Halvorsen,** formerly with Standard of New Jersey at Baton Rouge, now working with Pittsburgh Consolidation Coal Co., which recently announced plans for a plant to convert coal to liquid and gaseous fuels.

**H. H. R. Thompson,** assistant manager of Cia. de Petroleo Shell de Colombia, was recently honored at a party in Bogota prior to leaving for the United States. Thompson will be stationed in New York on the management staff of Asiatic Petroleum Corp.

**Jack S. Toler,** London district civil engineer, Humble Oil & Refining Co., Overton, Tex., has been transferred to the Louisiana division office, New Orleans, as assistant division civil engineer to handle offshore drilling. Other changes in the supervisory personnel of Humble's production department: **William A. Schaefer,** civil engineer in the North Texas Division office, replaces Toler as district civil engineer in the London district; **L. W. Cheaney,** assistant district chief clerk, Hub district, Columbia, Miss., transferred to the Eucutta district, Waynesboro, Miss., as district chief clerk; **J. F. Richie,** assistant district chief clerk, Avery Island district, New Iberia, La., transferred to the Hub district replacing Cheaney; **E. B. Woodell,** superintendent of the Lovell Lake pressure-maintenance plant, placed in charge of the Anahuac gas plant, Monroe City, Tex.

**M. U. Bateman,** Humble's district chief clerk at the Heyser gasoline plant, Bloomington, Tex., transferred to the Anahuac gas plant, Monroe City, as district chief clerk; **Joe M. Barber,** district chief clerk, Eucutta district, Waynesboro, Miss., transferred to the Heyser gasoline plant, as district chief clerk; **J. A. Sweeney** transferred from the Anahuac casinghead gasoline plant—construction—Monroe City, Tex., to the McCamey district, McCamey, Tex., as assistant district chief clerk; **H. D. Bradberry,** assistant district chief clerk, Wasson district, Denver City, Tex., transferred to Avery Island district, New Iberia, La.., as assistant district chief clerk; **E. S. Davis,** division clerk, West Texas division office, Midland, transferred to the Wasson district, Denver City, as assistant district chief clerk.

**Kenneth Twyman** has been promoted from storekeeper to field supervisor for Lone Star Gas Co. He will work out of the company's Dallas office.

**J. E. Gosline** has been appointed assistant general manager, producing department, Standard Oil Co. of California. Gosline was formerly manager of the southern district. This position will be taken over by **J. H. Thacher,** manager of California Standard's gas division, producing department, since 1945. Other appointments in Standard's producing department include **W. C. Johnson,** who becomes general superintendent, southern district, and **R. E. Clarke,** who succeeds Thacher as manager of the gas division.

**L. W. Elliott,** president of Standard-Vacuum Oil Co., has been promoted to brigadier general in the Officers Reserve Corps. Elliott served on the staff of Gen. Douglas MacArthur during the war.

**Gordon R. Kay,** New York, has been named president of Bay Petroleum Corp. and Chalmette Petroleum Corp., succeeding **Roland V. Rodman,** who late last month was elected president of Anderson-Prichard Oil Corp. A company announcement said **Charles U. Bay,** on leave as U. S. ambassor to Norway, will remain as chairman of the Bay and Chalmette boards. Kay has been associated with Bay the last 15 years. It also was announced a management committee has been named consisting of the following executives who were elected vice presidents: **B. W. Beebe,** chief geologist and exploration engineer; **H. I. Craig,** general production superintendent; **Charles O. Garbrecht,** superintendent of manufacture; **Leo L. Leabo,** director of sales; and **Dent N. Hand,** secretary-treasurer and comptroller.

**John W. Wagner,** Dallas, has been named public-relations director of the Texas Mid-Continent Oil & Gas Association, succeeding **North Bigbee,** who has resigned.

**J. M. Evans** is the newly appointed chief engineer and chairman of the board of engineers of Standard Oil Co. of California. Evans, assistant chief engineer since 1944, succeeds **H. H. Hall,** now a director and vice president of Trans-Arabian Pipe Line Co. Hall also continues with Standard as consulting engineer. Standard has also announced three other appointments in its engineering department. **R. W. Parker** and **E. S.**

# VALVES for Pipe Line Pump Stations

This is a typical installation of Walworth valves which can be secured from "Oilwell." Note the protective indicator stem which guards threads from dirt and indicates at all times exact position of discs.

★ Call on "Oilwell" for Double Disc Pipe Line Gate Valves, both Iron and Steel, or Lubricated Plug Valves, Steeliron and Steel.

★ Also Welding Fittings; Forged Steel Flanges; Pumps; Engines; Welding Saddles; Pressure Gauges.

★ LET the "Oilwell" Store be your pipe line warehouse. Check with the "Oilwell" representative nearest you and he will gladly explain how we are endeavoring to cooperate with many Pipe Line Operators and Contractors by stocking the wanted types and sizes of valves, plus complete related pipe line supplies. "Oilwell" stores and warehouses are located throughout the United States along your line.

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UNITED STATES STEEL

OIL WELL SUPPLY COMPANY ★ USS OILWELL ★ UNITED STATES STEEL

# "OILWELL"

**Warner** have become assistant chief engineers, and **A. W. Horton** was made assistant to the chief engineer.

W. D. CRAIG

**Wallace D. Craig,** assistant manager of asphalt sales, Standard Oil Co. of New Jersey, has been elected a vice president of the Asphalt Institute for the division comprising the Atlantic - Gulf territory. **Herbert Spencer** has been appointed as the institute's district engineer for New York and New Jersey. He will continue as secretary of the institute.

**John M. Loux** has been appointed supervisor of manufacturing training in Standard Oil Co. of New Jersey's refineries at Baltimore, Charleston, S. C., and the Baltimore printing plant. **William F. Woolley** has been assigned a similar task in the New Jersey plants.

**Grover W. Ferguson,** a 1947 Texas A. & M. College graduate, has been employed by The Texas Co. in its Beacon, N. Y., laboratories as a mechanical engineer in products-application department. **John M. Crone, Jr.,** has returned to the laboratories from an educational leave of absence of 1½ years at New York University where he obtained a master's degree in chemical engineering. **Howard V. Hess** has returned to his former position as a chemist in fuels research at the laboratories.

**A. T. Proudfit,** president of Creole Petroleum Corp., recently returned to his Caracas, Venezuela, home from a vacation in New Hampshire.

**C. V. Helm,** formerly professor of civil engineering at Dartmouth College, has joined the North Texas-New Mexico division of Stanolind Oil & Gas Co. as a junior petroleum engineer. He will be stationed at Andrews, Tex. Graduate engineers added to Stanolind's staff, their college, and present work station are: **Warren G. Johnston,** Alabama Polytechnic Institute; **T. R. Wright,** Texas A. & M.; and **C. A. Einarsen,** Colorado School of Mines, all junior petroleum engineers at Odessa, Tex.; **B. J. Rhoads, Jr.,** Missouri School of Mines, junior petroleum engineer; and **R. J. Sullivan,** Louisiana State University, petroleum engineer, both at Hobbs, N. M.; **L. E. Wilsey,** University of California; and **G. J. Cadra,** Texas Technological College, junior petroleum engineers, Brownfield, Tex.

**Robert M. Carter,** graduate in mechanical engineering from Rice Institute, has joined Shell Oil Co., Inc., and has been assigned to the North Texas division office.

**D. G. Stevens,** former plant-group supervisor in the technical - service division of Standard Oil Co. of Ohio's manufacturing department, has been transferred to the general engineering division as supervisor of the design and construction section. Other manufacturing department changes include: **Earl L. Mast,** transferred from the No. 1 refinery's engineering department to the design and construction section; **F. B. Shappell,** appointed assistant labor department foreman at the Lima refinery; and **R. D. Davis,** senior chemist, transferred to the Lima refinery as assistant foreman.

**Richard A. Nixon,** geophysical computer, and **Thomas W. Blackstone,** geologist, have joined the land and geological department of Cities Service Oil Co. in Houston.

**Dr. M. M. Leighton,** for the past 24 years chief of the State Geological Survey of Illinois, was cited by the University of Iowa, at its recent commencement, as a distinguished Alumnus, in recognition "of his eminence in his chosen field of geology and of his contributions to the public welfare."

**H. B. Britton,** formerly chief engineer, Plantation Pipe Line Co., Atlanta, Ga., is now on the staff of **W. R. Finney,** pipe-line adviser, Standard Oil Co. (N. J.). Britton has been assigned problems dealing with the Middle East pipe-line construction program. **E. B. Ayers,** assistant to the chief engineer, Plantation Pipe Line, has been given a temporary assignment to handle the duties of chief engineer.

**H. G. Anderson** has been promoted to shift foreman in the Texas City refinery of Pan American Refining Corp.

**F. B. Winbery,** United Gas Pipe Line Co., has been transferred to the Dallas district office, as manager, from Iowa, La. **Tracy C. Wilmoth,** Dallas, succeeds Winbery in the Iowa office as manager of the Southwest Louisiana district.

**H. R. McCombie,** chief chemist for Shell Chemical Corp. at Torrance, has been appointed senior technologist at San Francisco. Other Shell Chemical transfers and promotions include: **T. Hahn,** from chief clerk, San Francisco, to assistant office manager, Houston; **R. B. Hanning,** from acting assistant department manager, Torrance, to acting assistant chief chemist; **T. James,** from junior chemist to chemist, Shell Point; **P. G. Kloos,** from chemist to senior chemist, Torrance; **P. P. Kress,** from junior chemist to chemist, Shell Point; **R. K. Mead,** from senior clerk to chief clerk, San Francisco; **J. L. Morrill,** from assistant chief chemist to acting chief chemist, Torrance; **F. C. Pearce,** from technical assistant to acting assistant department manager, Shell Point; **G. A. Shahan,** senior clerk, from Shell Point to Houston; and **D. C. Wells,** technologist, from San Francisco to New York. In Shell Development Co., **Nean A. Ferguson, Lloyd T. Holt, William A. Landon,** and **Elmer H. Shermantine,** all pilot plant operators, experimental plants, have been named senior pilot plant operators at Emeryville.

**Sam E. Wilson, Jr.,** Corpus Christi, Tex., independent operator, has been elected chairman of Corpus Christi's 1948 Buccaneer Days celebration. The event will be staged in June.

**E. N. Durham,** Shell Oil Co., Inc., exploitation engineer, has been transferred from the North Texas division office to Centralia, Ill.

Seven engineers and chemists have been employed recently by the Beacon Laboratories of The Texas Co., Beacon, N. Y. They are: **Peter J. Cohn,** mechanical engineer; **James J. McSharry,** chemist; **Frank A. Heilman,** mechanical engineer; **Martin S. Donovan,** chemist; **Ishier Jacobson,** mechanical engineer; **Richard E. Kronauer,** mechanical engineer; and **George Sego,** chemical engineer.

**E. W. Bergquist,** former engineer in Holly Ridge-Lake St. John area of Louisiana and Mississippi for Interstate Oil Pipe Line Co., has succeeded **E. C. Mishou** as safety engineer in the employe relations department in Tulsa. Mishou recently was transferred to the southern division in Shreveport as assistant chief engineer.

**Charles McAlpine,** of London, England, is revisiting Petrolia after a 9-year absence. Making his first trip to foreign fields in 1899, he was among the first drillers in British Borneo, and has lived in London since 1931.

# PERSONALS

**John B. Patton,** formerly geologist in the Mount Vernon, Ill., office of Magnolia Petroleum Co., has been appointed research associate in economic geology in the geology department of Indiana University.

Eleven zone foremen have been appointed in the mechanical department in Standard Oil Co. of New Jersey's Bayway refinery to supervise and improve coordination in the mechanical service of the plant. These new zone foremen are: pipe department—**Fred Rhyner, Archer S. Collyer,** and **Richard McDougall;** boilermaking department—**Edward P. Sullivan, Herbert Haggas, Patrick J. Powers, Patrick J. Lynch,** and **Thomas Roberts;** carpenter department—**William Sisko** and **Harry J. Shanahan;** and riggers department—**Stief Babines.**

**Dr. Edward B. Peck,** special assistant to **George M. Maverick,** personnel director for Standard Oil Development Co., has been granted an honorary doctor of science degree from Clark University.

**Gilford Wright,** formerly chief engineer for United Gas Pipe Line Co.'s Sterlington station, near Monroe, La., has been transferred to the company's Rodessa compressor station, the same capacity.

**Ray Inglis,** former district engineer for Cities Service Oil Co. at Great Bend, Kans., has been transferred to Chase to succeed **Bill Devaney,** who was transferred to Hugoton field. Inglis has been succeeded by **E. W. Peterman.**

## Shifts

**William S. Herdan,** engineer, Southern California Gas Co., Burbank to Los Angeles; **K. B. McNamara,** engineer, Standard Oil Co. of California, Whittier to San Carlos, Calif.; **George C. Elliott,** foreman, Humble Oil & Refining Co., Jal to Eunice, N. M.; **Charles R. McKenney,** foreman, Magnolia Pipe Line Co., Corsicana to Garland, Tex.; **F. H. Goodwin,** foreman, Superior Oil Co., Conroe, Tex., to Waterproof, La.

**Charles S. Bergeron,** engineer, Stanolind Oil & Gas Co., Corpus Christi to Markham, Tex.; **D. B. Johns,** engineer, California Research Corp., Houston to Whittier, Calif.; **Dana G. McCarty,** engineer, Humble Oil & Refining Co., Houston to New Orleans; **Paul J. Moore,** engineer, Gulf Oil Corp., Kilgore to Daisetta, Tex.; **T. P. Ryan,** engineer, Standard Oil Co. of Texas, Midland, Tex., to Albuquerque, N. M.; **Peter E. Des Jardins,** engineer, Shell Oil Co., Inc., Monahans to McCamey, Tex.

**George B. Parks,** engineer, Kerr-McGee Oil Industries, Inc., Odessa, Tex., to Berwick, La.; **James C. Farris,** engineer, Stanolind Oil & Gas Co., Pampa to Fort Worth; **A. H. Ilfrey,** engineer, Humble Oil & Refining Co., Pampa to Avoca, Tex.; **William R. Goodier,** engineer, Shell Oil Co., Inc., Wichita Falls, Tex., to Tulsa; **Harry N. Stansbury, Jr.,** engineer, Atlantic Refining Co., De-Ridder, La., to Dallas; **Gordon James,** engineer, Gulf Refining Co., Harvey, La., to Houston.

**E. A. Courtney,** engineer, New Orleans to Hammond, La.; **B. F. Burke,** engineer, Carter Oil Co., Magnolia Ark., to Purcell, Okla.; **Ray Parker,** chemist, Wood River Oil & Refining Co., Chicago to Boulder, Colo; **Lyle E. Schaffer,** engineer, Standard Oil Co. (Ind.), Whiting, Ind., to Chicago; **Harold V. Smith,** engineer, B. F. Goodrich Chemical Co., Akron, Ohio, to Houston; **H. S. Petty,** foreman, Ohio Oil Co., Beloit, Ohio, to Middlesboro, Ky.

**W. K. Neish,** foreman, The Texas Co., Hamilton, Colo., to Havre, Mont.; **Charles W. Tucker,** engineer, Stanolind Oil & Gas Co., Denver, Colo., to High Island, Tex.; **O. H. Hall,** foreman, T. M. Deal, Burrton, Kans., to Perry, Okla.; **B. B. Bradish,** geologist, Skelly Oil Co., Wichita, Kans., to Walsenburg, Colo.; **Edward E. Gilbert,** geologist, Sun Oil Co., Madison, Wis., to Calgary, Alta.

**Richard D. Holt,** geologist, Rawlins, Wyo., to Houston; **Robert A. Forsman,** engineer, Oklahoma Natural Gas Co., Chickasha to Tulsa; **C. E. Dolhonde,** engineer, Shell Pipe Line Corp., Cushing, Okla., to Houston. **L. W. Smith,** superintendent, Phillips Petroleum Co., Oklahoma City to Pampa, Tex.

# DEATHS

**Robert Wilson,** 56, Kilgore, Tex., oil operator, died recently.

**I. J. Underwood,** 55, Tulsa, authority on natural-gas legislation, general counsel for Oklahoma Natural Gas Co., and attorney for several other oil and pipe-line contracting companies, died July 10 in West Point N. Y.

**Irk Ambrose Polhamus,** 67, veteran oil operator in western Kentucky, died July 8 in an Owensboro, Ky., hospital.

**William Presley Tucker,** 74, retired drilling contractor, died July 11 at his home in Tulsa. Tucker was a member of the now-defunct drilling firm, Tucker & Spangler, during his early residence in Tulsa.

**Carl Rhen,** 54, drilling foreman, Gulf Oil Corp., died at Crane, Tex., July 5.

**Edward A. Stubler,** 67, engaged in the oil-well supply business in Bartlesville, Okla., and Tulsa for many years until his retirement several years ago, died July 9 at his home in Tulsa.

**L. B. Tannehill,** discoverer of the first shallow production in Shackelford County, Texas, died last week in Los Angeles.

**James W. Dunlavey,** 76, who, with E. S. Curtiss, operated C & D Oil Co., died July 6 in an Olean, N. Y., hospital.

**William Wilson Durant,** 50, associated with Standard Oil Co. of New Jersey for 24 years with his retirement in 1940, died in Washington July 9.

**E. G. McKeever,** 55, president of Pan American Petroleum & Transport Co. and its subsidiaries and an executive of several other concerns, died July 9 in New York. McKeever entered the oil industry in 1915 as secretary and assistant to the president of Mexican Petroleum Co., Pan American subsidiary. He was elected vice president in 1926, vice chairman in 1932 and executive vice president in 1937. On January 1, 1945, he was promoted to the presidency to succeed Dr. Robert E. Wilson, when the latter was elected chairman of the board of Standard Oil Co. (Ind.)

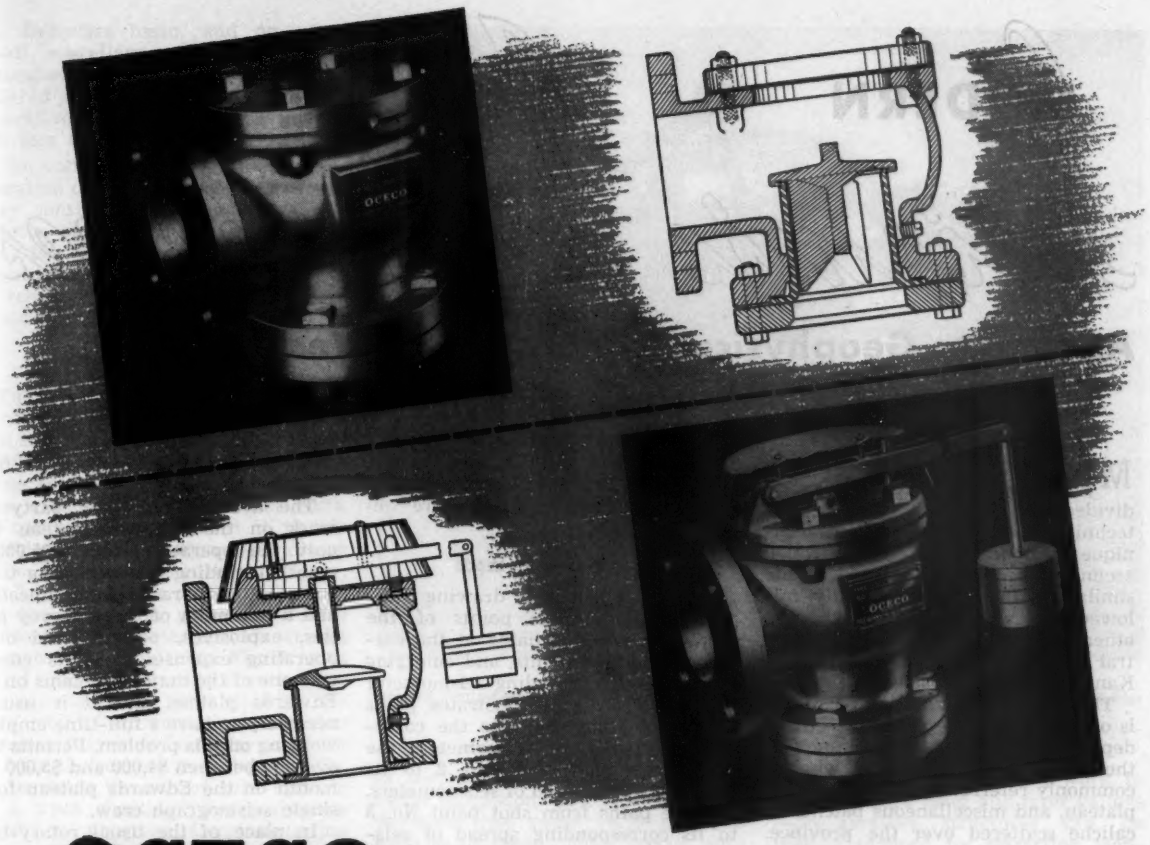
*E. G. McKEEVER*

**Edward William Sengel,** 55, veteran of 25 years' service with The Texas Co. and an electrician in the pipe-line division, died July 7 at his home in Wewoka, Okla.

**Fred Cotton,** 55, Tulsa oil producer and broker, died in Seminole, Okla., July 11 while on a business trip.

**George Lewis Becker, Sr.,** oil-field driller until his retirement several years ago, died at his Okmulgee home July 12.

**Fred J. Dieter,** 50, drilling contractor, died July 11 in Olean, N. Y.



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## *provide positive protection against excessive vacuum and pressure*

● Oceco V-103 Vacuum Relief and Oceco V-106 Pressure Relief Valves are efficient, highly dependable and moderate in price. They require little or no maintenance, and reflect in every detail the advantage of our long and intimate experience with the needs of practical every day operations.

These valves are furnished in 3" x 3", 4" x 4", and 6" x 6" sizes. They can be used in pairs when it is desired to protect the tank or vessel against the effects of both vacuum and pressure, or singly as required.

The V-103 Vacuum Relief Valves are designed for working pressures of 150 lbs. per sq. inch, and maximum temperatures of 600°F. Standard vacuum relief setting is 4 oz. per sq. inch but settings from 1½ oz. to 1 lb. per sq. inch can be furnished on special order.

The V-106 Pressure Relief Valves—see views above—are also built to withstand working temperatures up to 600°F. They are of lever and weight design, and can be furnished with pressure settings from 2 lbs. to 30 lbs. per sq. inch to meet the individual requirement.

Complete details including body and trim specifications, and price data furnished promptly on request.

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# MODERN Seismic Techniques

## Applied to Geophysical Exploration in West Texas

by Sidon Harris*

MODERN seismic techniques applied to West Texas can be divided generally into (1) reflection techniques, and (2) refraction techniques. Application of the reflection technique in West Texas is quite similar to the practice usually followed in the use of this method in other provinces, such as North Central Texas, East Texas, Oklahoma, Kansas, the Gulf Coast, etc.

The use of the refraction technique is occasioned by the presence of hard deposits close to the surface such as the Edwards lime, covering what is commonly referred to as the Edwards plateau, and miscellaneous patches of caliche scattered over the province. The principal advantage of the refraction method lies in the fact that the seismometers are placed at a comparatively great distance from the shot point, thus eliminating the "disturbance" carried by the shallow deposits of hard material. In general, the refraction technique is not as accurate as the reflection technique, and does not have as high a resolving power to detect small features. Consequently, it is recommended only where unfavorable reflection results are obtained.

*Southern Geophysical Co., Inc., Fort Worth.

### Refraction Methods

Fig. 1 is a schematic drawing illustrating approximate points of the refracted waves initiated at the corresponding shot points, and emerging under the corresponding seismometer spreads. The figure illustrates paths from shot point No. 1 to the corresponding spread of seismometers, the paths from shot point No. 2 to its corresponding spread of seismometers, and the paths from shot point No. 3 to its corresponding spread of seismometers. The diagram illustrates "spot refraction shooting." By placing the spreads and shot points much closer together it is possible to shoot "continuous line" refraction control. There are other forms of refraction shooting such as "broadside continuous-line shooting" where the line of seismometers parallels the line of shot points, and certain forms of "arc" or "fan" spot shooting where various spreads are swung along an arc from the same shot point.

The average refraction party for work on the Edwards plateau will cost the operator about $35,000 a month including one recording truck equipped with radio communication, and a minimum of three survey parties, explosives, permits, and other operating expenses. Permits constitute one of the major problems on the Edwards plateau, and it is usually necessary to have a full-time employe working on this problem. Permits will average between $4,000 and $5,000 per month on the Edwards plateau for a single seismograph crew.

In place of the usual rotary-type shot-hole drills employed in other portions of West Texas, it is more economical to use spudder-type drills on the Edwards plateau. Independent spudder contractors are now drilling shot holes on the plateau for $1.15 to $1.25 per foot. The above estimate of $35,000 per month includes all operating expenses for a one recording truck refraction party working on the Edwards plateau. Refraction work in

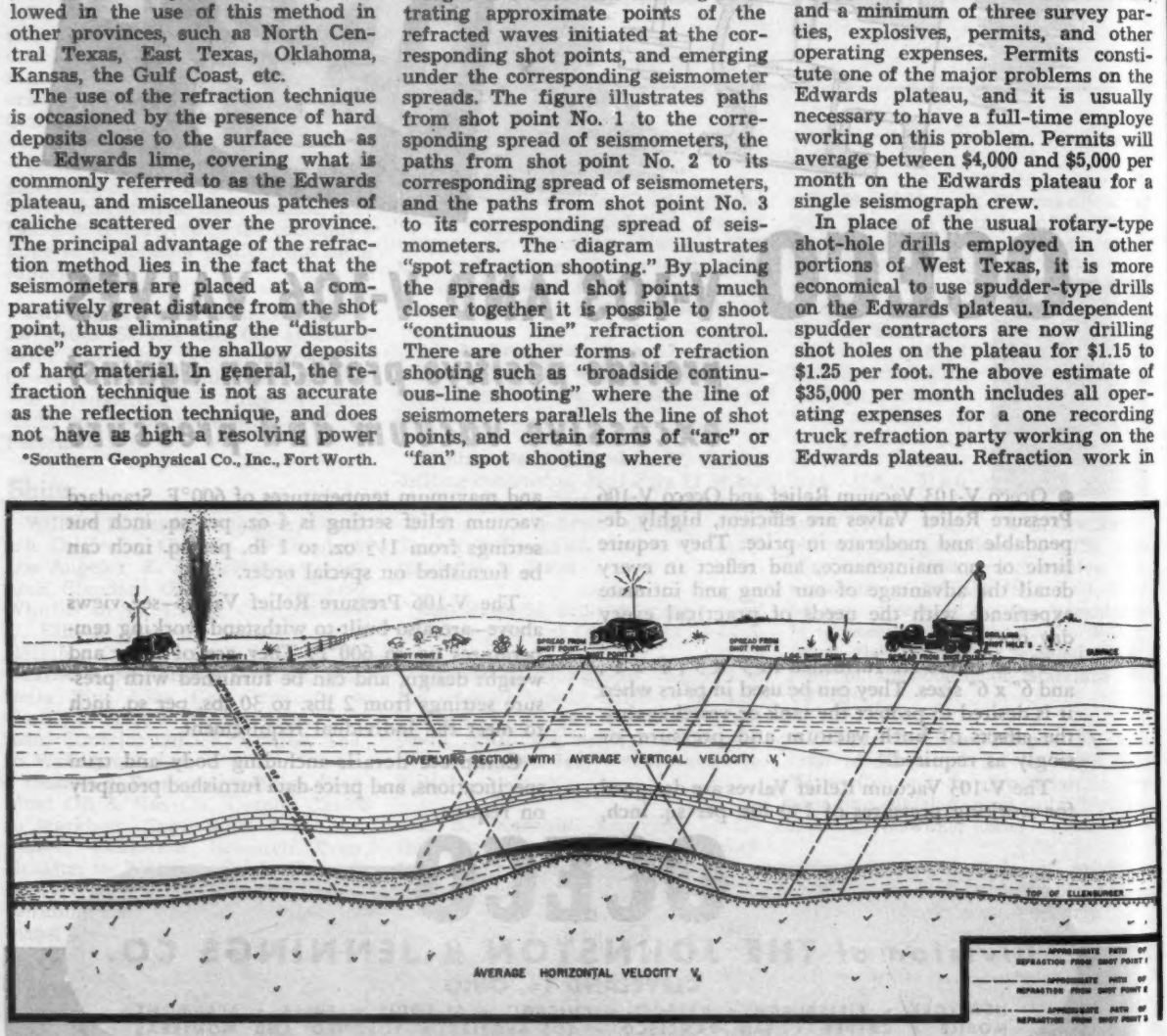



*Fig. 1—Refraction work. Schematic diagram illustrating approximate path of refracted waves from various shot points to corresponding seismometer spreads located at distances as great as 40,000 ft. from shot point*

the Delaware basin, and on other small miscellaneous areas scattered throughout West Texas which are covered with caliche deposits, is less expensive due to a reduction in permit fees and simplified drilling.

The cost per acre of refraction exploration on the Edwards plateau will vary considerably depending on the density of control, size of prospect, etc. However, upon a large-scale reconnaissance program this cost can be reduced to as low as $1.00 per acre in some areas.

### Reflection Methods

The average reflection seismic party operating in West Texas should cost the operator between $15,000 and $17,000 a month including two to three rotary shot-hole drills, permit fees, explosives, and all other costs. Of course, in some areas it is advisable to use as many as four rotary drills. In these areas costs run higher. Fig. 2 is a schematic drawing illustrating the reflection paths from shot points to seismometer spreads. It will be noted by comparing Fig. 2 with Fig. 1 that in reflection shooting the seismometers are very close to the shot point; whereas in refraction shooting they may be as far as 40,000 ft. from the respective shot point. Fig. 2 illustrates the use of split spreads in a "spot shooting" reconnaissance reflection program. Continuous-line control could be obtained by increasing the density of control until complete 100 per cent subsurface coverage is obtained.

### Distribution of Various Seismic Techniqués in West Texas and Eastern New Mexico

Fig. 3 may be used as a general guide to determine what techniques of seismic exploration should be used in certain portions of the province under discussion. Of course, it is understood that some variations will have to be made, under certain special conditions which may arise, depending on the nature of the assigned problem. However, in general, Fig. 3 can be regarded as a rough index in deciding what particular techniques to use in certain portions of the province. The following outline is to be used as a supplement to Fig. 3.

I. Edwards plateau—adaptable primarily to refraction techniques except for possible reflection work in canyons, creek beds, and river valleys —pre-Permian structures can be readily mapped by refraction techniques—approximate total monthly cost for operating a crew is $35,000—spudder-type drills preferable to rotary machines—region of high permit fees.

II. Southern portion of Central Basin platform—unfavorable reflection results in general, adaptable to refraction methods in Permian zone—approximate total monthly cost for operating a crew is $30,000—area of

*Special equipment used by Stanolind Oil & Gas in traversing heavy sand dunes in Winkler County, West Texas*

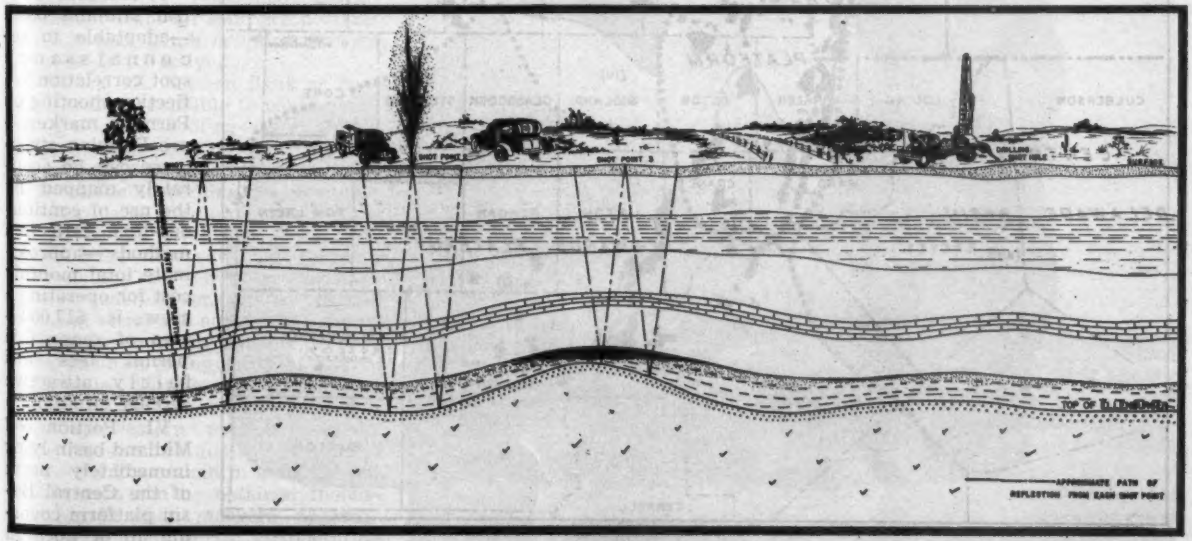


*Fig. 2—Reflection work. Schematic diagram showing approximate path of reflected wave from shot point to the corresponding seismometer spreads laid across shot points*

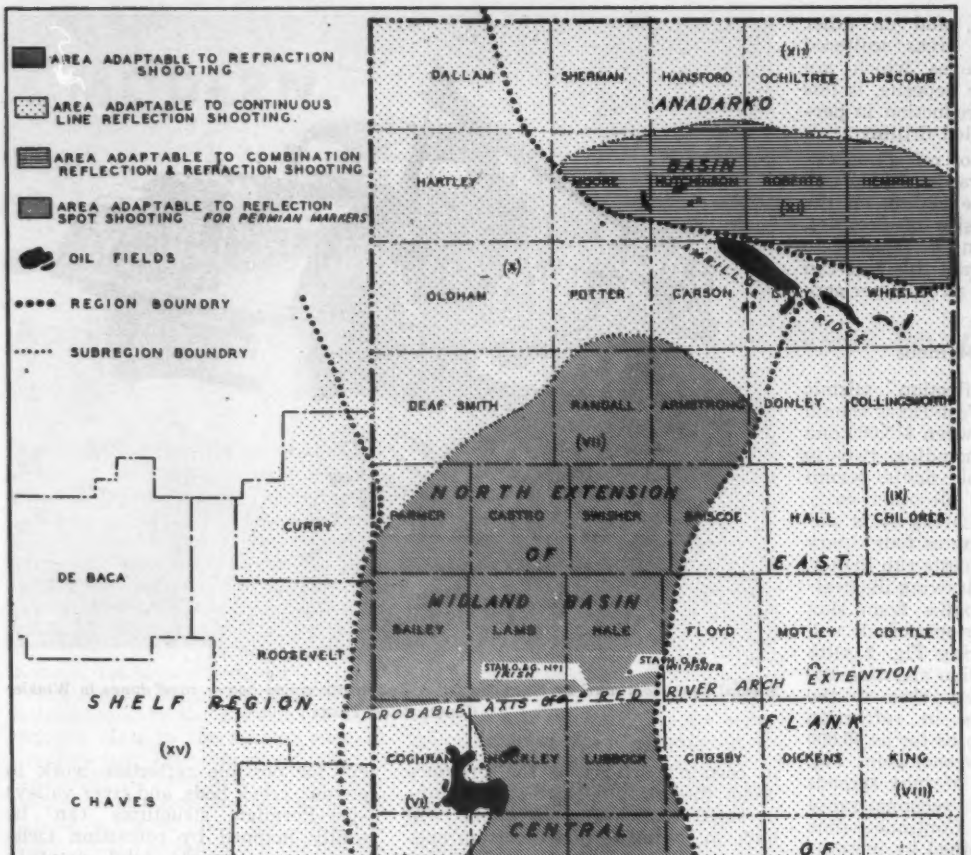



*Fig. 3—Map dividing West Texas and eastern New Mexico into various seismograph provinces according to type and cost of seismograph work*

high permit fees and tightly held acreage.

III. Major portion of Central Basin platform—adaptable to reflection continuous line shooting—pre-Permian structures can be accurately mapped by use of reflection continuous line methods—approximate cost for operating a crew is $17,000—area of high permit fees and tightly held acreage.

IV. Small portion of Central Midland basin lying just north of the Edwards plateau covering most of Midland County and northwest Glasscock County, southwest portion of Howard County, and southeast portion of Martin County—adaptable to continuous-line reflection shooting—pre-Permian structures can be mapped by the use of this technique—approximate total monthly cost for operating a crew is $17,000—permit fees somewhat less than areas I, II, and III—acreage situation more favorable than areas I, II, and III.

V. Includes Central Midland basin—adaptable to reconnaissance spot correlation reflection shooting on Permian markers—pre-Permian structures can be accurately mapped by the use of continuous-line reflection methods—approximate total monthly cost for operating a crew is $17,000—area of reasonable permit fees and fairly attractive acreage situation.

VI. Portion of Midland basin lying immediately north of the Central Basin platform covering all of Cochran County and portions of Yoakum

*Spudder-type drilling equipment used on the Edwards plateau*

and Hockley counties in addition to eastern edge of Lea County, New Mexico, and southeastern corner of Roosevelt County, New Mexico—adaptable to continuous-line reflection shooting—pre-Permian structures can be readily mapped by use of this technique—province of rather hard drilling requiring three or more rotary drills—approximate total monthly cost for operating a crew is $22,000 per month—area of relative high permit fees and tightly held acreage especially in Yoakum and Hockley counties.

VII. Northern portion of the Midland basin lying north of the Red River arch extension—adaptable to reconnaissance spot correlation reflection technique to map Permian markers—pre-Permian structures readily mapped by use of continuous-line reflection technique—area of fairly easy drilling—approximate total monthly cost for operating a crew is $17,000—very reasonable permit fees, and except for southern portions of Hale and Lamb counties acreage situation is attractive.

VIII and IX. Eastern flank of Permian basin—adaptable to continuous-line reflection shooting—approximate total monthly cost for operating a crew is $17,000—area presents occasional difficult drilling problem due to outcrops of gypsum—record quality in general lower than in areas V and VII—however, pre-Permian markers can be generally worked—area is generally one of low permit fees and attractive acreage situations.

X. Extreme north portion of Permian basin covering parts of twelve Panhandle counties—adaptable in general to continuous-line reflection shooting—western portion presents difficulty—record quality in general somewhat lower than in area VII but usable data can be obtained including pre-Permian markers—approximate total monthly cost for operating a crew is $20,000—area of low permit fees and open acreage—"semivirgin" —especially along western boundaries.

XI. Part of Anadarko basin lying immediately north of Amarillo ridge —adaptable to a combination of reflection and refraction shooting—in general poor reflection results are obtained—approximate total monthly cost for operating a crew is $20,000.

XII. Portion of Anadarko basin including parts of Dallam, Sherman, Hansford, Ochiltree, and Lipscomb counties—generally adaptable to continuous-line reflection methods—approximate monthly cost for operating a crew is $17,000—area of low permit fees and open acreage—semivirgin.

XIII. Central Delaware basin—an area of very poor reflection results but adaptable to refraction techniques —approximate total monthly cost for operating a crew is $25,000—very low permit fees and open acreage—due to extreme variation in the salt section down to about 3,000 ft. over portions of this province, it is recommended that any seismic structure be checked with deep core holes to a depth of 3,000 ft. with corresponding seismic velocity surveys to this depth.

XIV. Shelf zone of Delaware basin —adaptable to a combination of reflection and refraction techniques—approximate total monthly cost for operating a crew is $25,000—reasonably low permit fees and fairly attractive acreage situation.

XV. Shelf region—covering parts of Lea, Chaves, and Roosevelt counties, New Mexico—adaptable to continuous-line reflection methods—approximate total monthly cost for operating a crew is $17,000—very low permit fees in general and attractive acreage situation—semivirgin.

*Rotary-drilling operations in progress near Big Spring, West Texas*

# CYCLING PLANTS

## Headed for 4.5 Million-Gallon-Daily Capacity

*One of the really big "cycling" plants on the Gulf Coast—Erath installation in Vermilion Parish, Louisiana. Capacity 504,000 gal. per day*

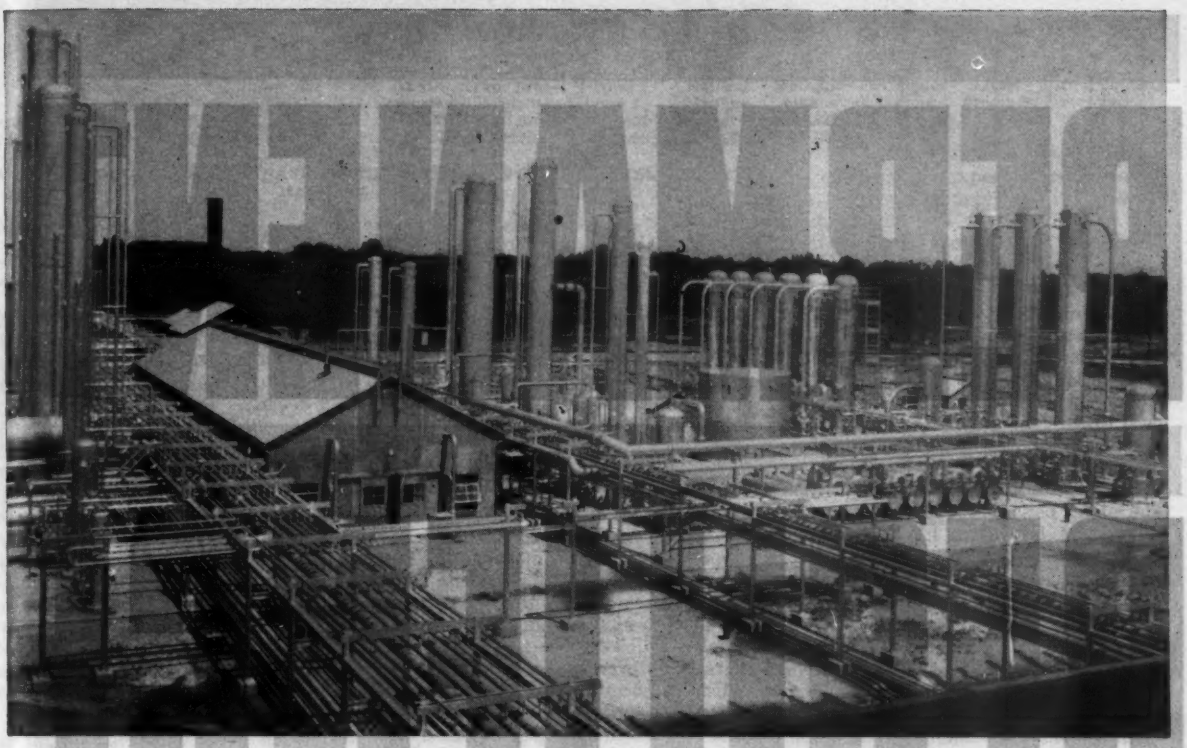
**by Arch L. Foster**

ONE of the most startling totals in any of the oil and gas industries divisions is the quantity of liquid products output, today, by the recovery plants engaged in cycling activities. These plants, in toto, are rated at nearly 4,000,000 gal. of liquid products per day. Two large units The California Co. is building in Louisiana and Mississippi, each reported to be capable of processing more than 100,000,000 cu. ft. of raw gas per day, will boost the total to well over the 4-million mark and could easily make it 4.5 million. Their estimated daily production is 11,300 bbl. of liquids.

*There are several kindred or related-type hydrocarbon recovery plants besides the true "cycling" plants. This is Cities Service Oil Co.'s "gaso-chem" (chemicals from gas) plant at Tallant, Okla.*

The "No Gas Flares" slogan of Texas and similar attitudes in other important gas-producing states will of necessity increase the output from this and kindred types of plants. In fact it seems reasonable to state that, except for the smaller fields where gas-return operations are still uneconomic, all so-called natural-gasoline plants installed in the future will be the liquid-recovery divisions of gas cycling, recycling, repressuring, and pressure-maintenance systems.

In this discussion reference is made to the production from 23 plants included in The Oil and Gas Journal's survey as cycling plants. Texas alone, which includes the largest capacity in cycling plants, furthermore has a sizable number of fields which are considered suitable for economical operation of future cycling units. All are being considered for the installation of such units; the state authorities are holding hearings to discover if such operations are economically sound, in each field. It is quite possible that production of liquid hydrocarbons from cycling and analogous types of plants may exceed that from so-called natural-gasoline plants, in a few years.



*New high-pressure absorption "gasoline" plant of Chicago Corp. in Carthage field, East Texas. Capacity 80,000 gal. per day plus liquefied petroleum gas products*

At present, cycling plants rate one-third the capacity of natural-gasoline plants. Such a trend will supply the natural-gasoline (or refining) industry with heavy naphthas for blending purposes, to reduce vapor pressures of what hitherto has been called natural gasoline. It is enlarging the picture for natural gasoline and light hydrocarbons, and so may have a definite effect on the outlook for the refining industry. Introduction of these heavy ends, which include or may include kerosine and gas-oil fractions, also introduces a disposal problem, especially for that portion of the total production which may be included properly in motor fuels.

### 1942 and Hence—Capacity Reports

The first production data which have been found easily available are the figures published for 1942 (see Table 1). It is notable that more than a million barrels per month of motor fuels alone were shown as average production at that time, with 1.5 million barrels of condensate per month. For 1946, total liquid production for Texas alone, is shown in Tables 2, 3, and 4, in which a total of 11 million barrels of condensate was produced, 40 million barrels of natural gasoline and other products, to a total liquid recovery of 65 million barrels. This is about 180,000 bbl. per day. These figures are sizable even in terms of refining outputs. In 1946 Texas alone produced more than twice the amount of liquids from these operations than did the entire country in 1942, which gives some idea of the growth of the operations. It is obvious that the cycling plant and its liquid-recovery counterpart are here in a big way.

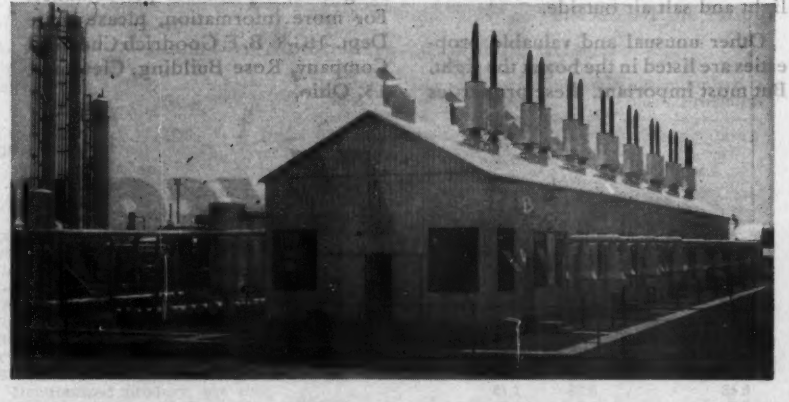
A study of the ownership of cycling plants shows that among units now operating, about 1,740,000 gal. per day of capacity is for companies

**TABLE 1—CYCLING PLANT PRODUCTION, 1942**
(Average bbl. per month)

| Area— | Condensate | Motor fuel | Propane-butane | Other products |
|---|---|---|---|---|
| All Texas-Louisiana | 1,569,300 | 1,383,200 | 228,000 | 1,090,500 |
| Texas only: | | | | |
| Month | 1,269,300 | 358,200 | 153,000 | 790,500 |
| Day | 42,310 | 11,940 | 5,100 | 26,350 |

**TABLE 2—CYCLING PLANT PRODUCTION IN 1946 (BBL.)—TEXAS, 30 TO 33 PLANTS**

| | Gas processed 1,000 S.C.F. | Crude condensate | Gasoline (natural) | Butane-propane | Methane-ethane | Misc. products | Total liquid prod. |
|---|---|---|---|---|---|---|---|
| Total | 701,128,588 | 3,480,316 | 10,072,061 | 14,535,578 | 124,328 | 766,257 | 18,906,479 |
| Avg. per month | 58,427,382 | 290,026 | 839,338 | 1,211,298 | 10,361 | 63,855 | 1,575,540 |



*Continental Oil Co.'s "pressure-maintenance" plant in Rincon field, Starr County, Texas. Injection capacity to input wells is 15 million cubic feet per day at 2,000 psi.*

# PERMANENT RESILIENCE

Resilient parts made from HYCAR synthetic rubber *stay* resilient. That's partly because of HYCAR's unusual chemical stability—its resistance to oil and gas, acids and most other chemicals. And parts made from HYCAR are extremely resistant to the effects of oxidation, sunlight, and normal aging. A HYCAR sealing ring, for example, will maintain a positive seal through years of service even when constantly exposed to oils and acids inside the pipe, and sunlight and salt air outside.

Other unusual and valuable properties are listed in the box at the right. But most important, these properties may be had in an almost limitless number of combinations, each designed to meet the specific service conditions of the finished part. Parts made from HYCAR have seen service in *every* industry, giving long life, dependability, and economical operation.

That's why we say ask your supplier for parts made from HYCAR. Test them in your own applications, difficult or routine. You'll learn for yourself that it's wise to use HYCAR for long-time, dependable performance. For more information, please write Dept. HG-8, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio.

## WHAT HYCAR DOES IN OIL FIELD APPLICATIONS

1. *Resists oil and gas—even under high pressures and temperatures.*
2. *Resists action of abrasive-laden fluid under high pressure and at high velocity.*
3. *Wears at slow rate even under worst conditions.*
4. *Makes a positive, leak-proof seal, even after a long period of service.*
5. *Provides high elasticity.*
6. *Gives high tensile strength.*
7. *Has minimum tendency to cold flow and compression set.*

**Hycar**
Reg. U.S. Pat. Off.
*American Rubber*

**B. F. Goodrich Chemical Company**
A DIVISION OF THE B. F. GOODRICH COMPANY

TABLE 3—LIQUID HYDROCARBON RECOVERY IN 1946 (BBL.)—TEXAS

| | Condensate GP-1 reports | Condensate crude process plants | Total 1 and 2 | Natural gasoline | Methane-ethane | Propane-butane | Other products | Total liquid recovery |
|---|---|---|---|---|---|---|---|---|
| Total | 5,644,383 | 5,411,080 | 11,055,463 | 40,539,242 | 124,328 | 12,642,206 | 934,892 | 65,296,131 |
| Average per month | 470,365 | 450,923 | 921,288 | 3,378,253 | 10,361 | 1,053,517 | 77,908 | 5,441,344 |

TABLE 4—PRODUCTION FROM NATURAL GASOLINE PLANTS IN 1946 (BBL.)—TEXAS, 164 TO 175 PLANTS

| | Gas processed, M.c.f. | Crude condensate | Gasoline, natural | Butane-propane | Other products | Total |
|---|---|---|---|---|---|---|
| Total | 1,441,794,808 | 1,796,723 | 30,463,535 | 8,254,439 | 269,838 | 40,784,535 |
| Avg. per month | 120,149,567 | 149,727 | 2,538,628 | 687,870 | 22,486 | 3,398,711 |

also having refining branches (see Table 5). Among the so-called independents, without correlating refining capacity, the cycling liquid-recovery capacity is rated at 2,220,000 gal. per day. Thus practically 40 per cent of the total cycling-unit liquid-recovery capacity is connected directly with the oil-refining industry. The remaining 60 per cent of production (rated) may find its way to market via established refining-marketing outlets, or otherwise. In fact the manner by which the cycling products go to market can affect importantly the market for motor fuel and other refinery products for the refiners themselves.

Results of the plant survey made for this paper show that, as far as reported, the octane rating of motor fuel made direct from products of so-called distillate plants varies from 63 to 67 motor method, before the addition of TEL. Addition of 3 cc. of TEL per gallon will raise this straightrun material up to around 75 or higher, depending on the properties and TEL susceptibility of the individual product. A number of cycling operators segregate isobutane from the remainder of the liquid, doubtless to sell to alkylation-unit operators or for inclusion in aviation or other fuel. No dependable information regarding the price received for this isobutane is available. Obviously, however, the inclusion of more natural to raise the total motor-fuel yield, or of heavy ends for the same purpose, in the first case will raise the octane number of the gasoline and in the latter case will lower this rating. Clear also is the fact that the "spread" between motor and research methods results of octane ratings will be small to nonexistent; some reports show the two ratings to be identical or only of one or two numbers difference. This lack of differential may be a serious handicap to the maker of the fuel in selling to marketers, as much stress is being placed on this spread by gasoline sellers in general.

A large percentage of the total product of a majority of the cycling companies is being made into motor fuels. From 70 to 95 per cent of total liquid output becomes motor gasoline.

Any consideration of the matter of orderly and practical marketing of these products must include ways and means for upgrading the raw product. The octane rating of the natural gasoline reported ranges from a low of 65 to a high of 77, the difference being caused mainly by the differences in vapor pressures of the products reported. Two to five numbers difference is shown in products from one plant between vapor pressures of, say, 14 lb. Reid and 22 lb. The higher the vapor pressure and the lower the end point of the motor fuel produced from these materials the higher the octane rating and the lower the yield. Therefore, the percentage of total liquid going to gasoline will be determined by the comparative market price of the various products; if a good market for kerosine is open at essentially the same price as motor fuel, the producer will not be interested in extending his yield of gasoline. If the natural-gasoline price is approaching that of motor fuel, he will be as willing to sell his material as natural as to turn it into motor fuel direct.

### Specifications Vary Widely

Specifications for these finished motor fuels vary somewhat widely, although cycling-plant makers of gasoline show much hesitancy in divulging their exact specifications. End points appear to range from 375° to 450° F. Sulfur is almost universally low as might be expected from products from such sources. Caustic wash normally suffices for this phase of purification; in some cases sweetening is used to reduce mercaptan sulfur and improve TEL susceptibility.

TABLE 5—DISTILLATE CAPACITY OF MAJOR AND OF INDEPENDENT COMPANIES

| | No. of companies | Capacity gal./day |
|---|---|---|
| Major | 12 | 1,740,000 |
| Independent | 24 | 2,220,000 |
| Total capacity | | 3,960,000 |

For major octane-rating improvement—this is one of the two main specifications with volatility, of which the cycling-plant operator has a surfeit—three main courses are open. Superfractionation may segregate the major portion of the isoparaffins and recombine these to form a high-octane-rating gasoline. Similarly, high-rating alkylate or cracked material may be bought and used to blend; both courses are expensive and lower seriously the yield of motor fuel, presumably the most profitable product of these plants.

The other two courses are thermal and catalytic reforming. No direct data are available to show specifically the results to be obtained by thermal cracking alone. The heavy naphtha-light kerosine fraction of the cycling-recovery-plant product is reported to show about the same results from thermal cracking as is heavy naphtha fractions from crude and such data are available from many years of reforming operations.

Reforming a Mid-Continent heavy refinery naphtha of above 200° F. initial and 390° F. end point at 100 psig. and 960° F. has shown the following results:

| | | | | | |
|---|---|---|---|---|---|
| Yield, vol. per cent | 93.0 | 86.1 | 82.1 | 80.1 | 76.1 |
| Octane No., m.m. | 64.5 | 67.0 | 68.5 | 70.0 | 72.5 |

With polymer from reformer gases added:

| | | | |
|---|---|---|---|
| Yield, vol. per cent | 94.6 | 84.9 | 80.4 |
| Octane No., m.m. | 65.0 | 69.5 | 73.5 |

It is noted here that, for an 80 per cent over-all yield, without polymer the octane rating is 70 motor method while with polymer added the rating

TABLE 6—CATALYTIC REFORMING OF DISTILLATE

| Test data— | Debutanized distillate (charge) | Debutanized distillate, Product A Case 1 | Case 2 | Case 3 | Debutanized blend, Product B Case 4 | Case 5 |
|---|---|---|---|---|---|---|
| Distillation: | | | | | | |
| 5 per cent Evap., °F. | 128 | 131 | ... | ... | 191 | ... |
| 20 per cent Evap., °F. | 157 | 154 | ... | ... | 232 | ... |
| 50 per cent Evap., °F. | 216 | 202 | ... | ... | 280 | ... |
| 95 per cent Evap., °F. | 397 | 378 | ... | ... | 414 | ... |
| Gravity, °A.P.I. | 66.1 | 63.4 | ... | ... | 56.2 | ... |
| Vapor pressure, Reid | 8.5 | 6.6 | 11.5 | 11.5 | 4.9 | 11.5 |
| U.O.P. characterization factor | 12.2 | 11.9 | ... | ... | 11.9 | ... |
| Octane rating: m.m. clear | 47.2 | 65.7 | 70.6 | 66.8 | 51 | 64.1 |
| Octane rating, 3 cc. TEL | 73.4 | 82.8 | 86.3 | 84.2 | 72.6 | 84.2 |
| Research method, clear | 46.5 | 67.6 | 73.1 | 71.0 | 54.7 | 67.3 |
| Research method, 3 cc. TEL | 73.4 | 86.8 | 90.3 | 87.7 | 76.0 | 86.7 |
| Yield on raw product, per cent | 88.1 | 66.0 | 81.4 | 84.5 | 32.8 | 89.8 |
| Blends: Lt. overhead, per cent | ... | ... | ... | ... | ... | 53.3 |
| Debutanized product, per cent | ... | ... | 81.1 | 83.5 | ... | 36.6 |
| Equiv. polymer gasoline, per cent | ... | ... | 9.2 | 6.4 | ... | 3.5 |
| n-Butane added, per cent | ... | ... | 9.7 | 10.1 | ... | 6.6 |
| Total, per cent | ... | ... | 100.00 | 100.00 | ... | 100.00 |

is 73.5, a decidedly profitable increase provided the cost of the increase is not excessive. The raw naphtha had a 40-octane rating.

In another instance, reforming of Mexican naphthas containing 0.04 to 0.13 per cent sulfur, at 750 psig. and 990° F., shows the following results (The Oil and Gas Journal, December 9, 1944, p. 76):

| Product— | Yields, etc. | | |
|---|---|---|---|
| Reformed gasoline, per cent | 67.9 | 62.4 | 78.7 |
| Polymer gasoline, per cent | 5.2 | ... | ... |
| Residuum, per cent | 2.3 | 5.7 | 2.4 |
| Gas and loss | 29.8 | 31.9 | 18.9 |
| Octane rating, m.m. | 75.0 | 74.0 | 69.0 |
| Octane rating, research | 81.0 | 79.0 | 76.0 |
| Sulfur, wt. per cent | 0.03 | 0.06 | 0.07 |
| Octane rating, charge, m.m. | 59.0 | 52.0 | 47.0 |
| Octane rating, research | 59.0 | 55.0 | ... |

Here the so-to-be-desired spread between raw and cracked product rating is apparent. Octane-rating boost is high, from 16 to 29 points increase, but yield is especially low even after polymerization of cracked gases.

### Distillate Reforming by Catalysts

So much attention has been given to cracking heavy oils via catalysts that little work has been done, so far, on reforming of low-grade light stocks, especially on condensate or distillate-plant motor-fuel or naphtha fractions. Pilot-plant results have been made available on reforming via bauxite-catalyst naphthas from some of the companies whose production is reported here. Table 6 shows the properties of two charge stocks and of four reformed products therefrom, to give some idea of the results which may be obtained by this route to quality improvement.

Note that the debutanized charge stock in the first column has essentially the distillation range of motor fuel, with 8.5 lb. R.v.p. With motor method and research octane ratings essentially the same—47.2 motor and 46.5 research—and the same TEL susceptibility, 3 cc. raises the rating to 73.4 by either method. Catalytic reforming of this 88 per cent of the raw distillate gives a 6.6-lb. R.v.p. product in Case 1, showing a 66 per cent yield on the raw product for a motor method clear rating of 65.7 and research rating of 67.6. Addition of 3 cc. of TEL raises these ratings to 82.8 and 86.8 respectively.

Blended with light material to 11.5 lb. vapor pressure, the final product in cases 2 and 3 gives yields of 81.4 and 84.5 per cent of the raw product, with 3 cc. TEL motor method ratings of 86.3 and 84.2 for the two blend compositions as shown in the lower part of the table; research ratings of 90.3 and 87.7 respectively, getting into really high ratings for these products and yields.

Debutanized product in case 4 is a low vapor pressure, high 5 per cent distillation temperature, with 51 motor

**TABLE 7—YIELDS AND OCTANE RATINGS BY CATALYTIC REFORMING OF DISTILLATE**

| Operations and tests— | Product A | Product B |
|---|---|---|
| Charge, per cent raw gasoline | 97.7 | 94.9 |
| Charge, gaso.-kero. blend per cent | ... | ... |
| Charge, kero.-gas oil blend per cent (raw stock) | ... | ... |
| Charge, debutanized plant prod., full | ... | ... |
| Treating, psig. | 50 | 50 |
| Treating temp., °F. | 1,031 | 1,058 |
| Flow rate, bbl./day/ton | 170 | 179 |
| Steam diluent, lb./bbl. change | 27.6 | 31.2 |
| *Yields per cent; olefins, $C_3$-$C_4$ | 6.78 | 12.1 |
| 400-e.p. gasoline | 85.82 | 75.4 |
| Residuum, per cent | ... | ... |

| | Charge | Product | Charge | Product |
|---|---|---|---|---|
| O.N. clear | 59.1 | 69.5 | 58.7 | 70.8 |
| O.N. 3 cc. TEL | 80.0 | 85.2 | 80.0 | 84.3 |
| O.N. Res. clear | 62.0 | 73.5 | 60.7 | 76.8 |
| O.N. Res. 3 cc. TEL | 82.8 | 89.7 | 81.7 | 89.7 |

method octane rating. In case 5, reforming with a 32.8 per cent total yield (gasoline) and blending with three other components to 89.8 per cent of the raw reformer charge yields a product with 64.1 octane rating clear, motor method, 67.3 research clear, and with 3 cc. TEL 84.2 and 86.7 octane rating respectively. In Table 7 additional yields on reforming of various stocks are shown. A debutanized gasoline reformed at 50 psig. and 1,031° F. with steam diluent yields about 86 per cent of 400° e.p. gasoline with nearly 7 per cent of polymerizable olefins. Octane ratings are boosted from 59.1 motor to 69.5 clear, and from 80.0 to 85.2 with 3 cc. TEL; research results are better, 3 cc. showing 89.7 rating. The best results are obtained from a cracking of 82-18 kerosine-gas oil mixture charge, showing 97.6 research octane rating, however from only 24 per cent yield. The residuum, presumable, is gas oil.

It appears obvious that the distillate or cycling-plant operator can make salable housebrand gasoline by the addition of TEL to blends of his own products, if he so chooses, and with reasonably good yields, over-all. He can do this so long as competitive octane ratings do not rise much above the present approximate levels, for the major portion of the country. By thermal cracking he can produce cracked blending stocks comparable, apparently, to similar products made from refinery heavy naphthas. Then too, he can crack thermally or catalytically the kerosine-gas oil fractions he produces, to compare favorably with refinery production from analogous stocks. He can build catalytic cracking-desulfurizing units to improve his product if he chooses and if he has production enough to warrant installation of such units. So far as can be seen, only a small number, probably a dozen at most, of the cycling-liquid-recovery plants could justify installation of a cracking unit (catalytic or thermal), on the face of total available charge-stock volume.

It appears reasonable to assume that, if the big operators continue to make motor fuel from their product they must meet octane rating competition or cut prices or grades. Cutting prices may come as a result of an oversupply of motor fuel and high-octane-rating competition, and is serious for market stability, potentially. Those plants which cannot justify a cracking unit must meet market demands by TEL addition as far as possible, and sell at reduced prices when octane rating levels go higher than they can meet successfully or economically.

*This article was given verbally by the Journal's refining editor at the San Antonio meeting of the Western Petroleum Refiners Association, March 24-26, and is here presented with supplemental statistical data since made available.*

# BOOKS

STORY OF A USEFUL LIFE. Published in the American Petroleum Institute Quarterly for April 1947.

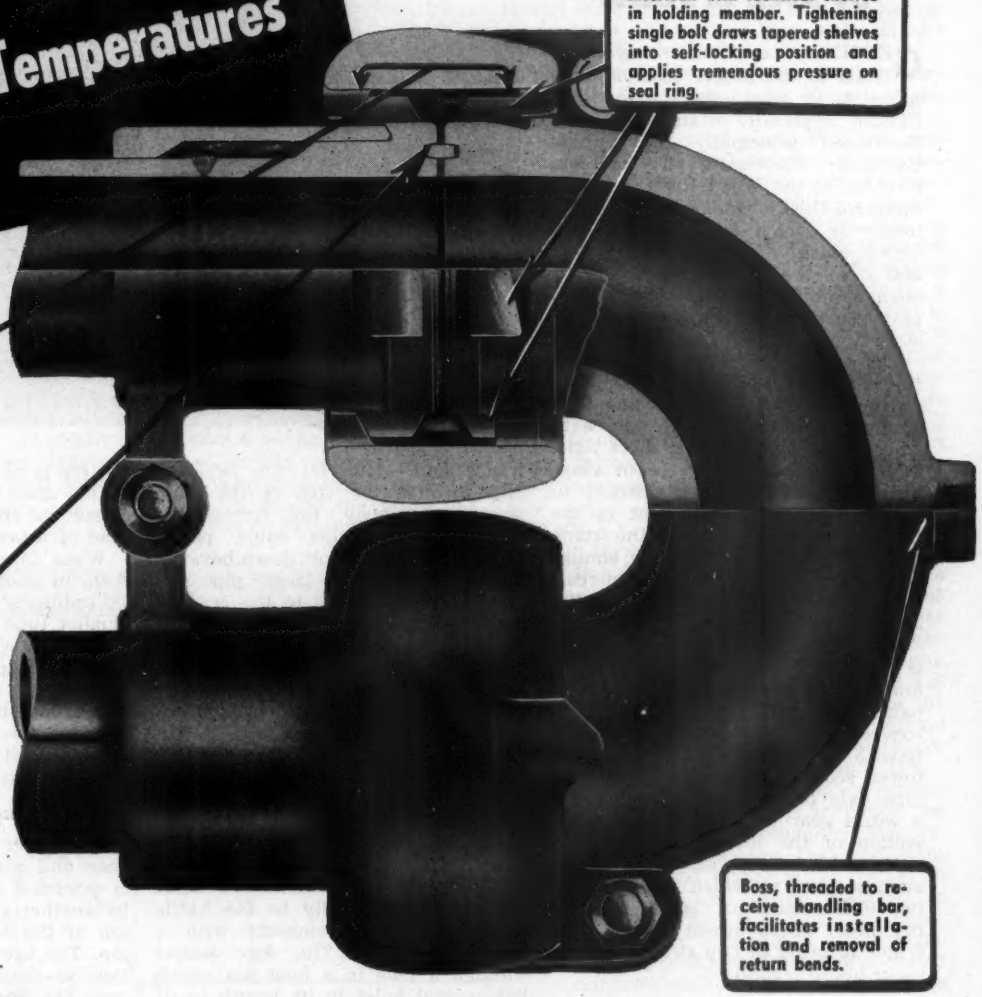
"This is the story of a useful life, that of J. Edgar Pew, who spent an epochal 50 years in the petroleum industry—to the constant betterment." Thus states the foreword of a highly interesting account of life of one of the industry's outstanding leaders. The story begins with Pew's first job in the oil industry with Sun Oil Co.'s new refinery at Toledo in 1896. That same year he went to Corsicana, Tex., to investigate possible new sources of oil. He did not remain long that time, but when he returned a little later it was to stay a long time—"until his name became one of the best known in the production end of the oil industry." The story is illustrated with several photographs of early-day oil scenes found in Pew's personal files, many of them unidentified, and with a double-page spread of sketches highlighting the subject's career. The history is a fitting tribute to a man who will be long remembered in the industry he grew up with.

1945 REFERENCE REPORT ON CERTAIN OIL AND GAS FIELDS OF NORTH LOUISIANA, SOUTH ARKANSAS, MISSISSIPPI, AND ALABAMA. Published by Shreveport Geological Society, Shreveport. Vol. 1, $12.50; Vol. 2, $10.

In both volumes of this work, each field is presented individually and is accompanied by a map. The section is illustrated by either a cross-section or columnar section and where possible, a structural interpretation is shown. The history and extent of development are outlined, production statistics are given, together with other pertinent data such as facilities and processing plants. The first volume contains, in addition to the 55 fields, an index map of oil and gas fields and salt domes in East Texas, North Louisiana, Mississippi, and Alabama; two stratigraphic sections; and one structural section. The second volume includes, in addition to Delhi, West Delhi, and 24 other fields: 10 stratigraphic sections; a bibliography of oil and gas fields in South Arkansas, North Louisiana, Mississippi, and Alabama; tabulation of pertinent data on fields in these areas, and two new papers. The volumes are prepared by and for geologists, but are designed to be of value to engineers, oil-company executives, and all others engaged in oil and gas production.

# Why Unibolt Furnace Fittings Seal Even The Lightest Gases At Extreme Temperatures

# Inside Story



9-degree tapered shelves made integral with return bend body, interlock with identical shelves in holding member. Tightening single bolt draws tapered shelves into self-locking position and applies tremendous pressure on seal ring.

ort distance between nts of support minimizes ntraction and expansion. rial seat pressure main- ned uniformly throughout perature cycle.

Loose metal seal ring seats in 18-degree included angle in ring grooves, providing additional multiplication of pressure applied to the bolt (Total: 20 to 1). Ring and grooves machined to such close tolerances that distorting pressure need not be applied to effect seal.

Boss, threaded to receive handling bar, facilitates installation and removal of return bends.

The fact that UNIBOLT Streamlined Return Bends may be depended upon to provide a dependable seal of light gases under elevated temperatures has been proven on a number of installations where furnace outlet temperatures range up to 1600 degrees F. *This positive seal is accomplished by tightening a single bolt . . .* No rolled-in tubes, no seal welding, no tapered plug closures, no lapping to make a seal, no need for steam in the header boxes. They permit faster "heading up," replacement of a single tube and returning any return bend body to any two tubes. Completely interchangeable parts assure low-cost maintenance.

For complete details, write for Bulletin No. R-42.

## NEW TYPE TUBE ALIGNING - ANCHOR CLAMP

The UNIBOLT Tube Aligning-Anchor Clamp serves two purposes: It provides a rigid support for the furnace tubes when the return bend body is removed for tube inspection. Heretofore, the tubes might move out of position when the bend was removed. The clamp also serves as an anchor for the holding member, thus eliminating the split ring which was formerly provided for this purpose. The clamp remains in position until it is desired to replace the tubes.

## THORNHILL-CRAVER COMPANY

HOUSTON UNIBOLT REFINERY FITTINGS TEXAS

FOAM TOWERS

# Carry Firefoam to Where It Can Do the Most Good

*by Arch L. Foster*

GETTING fire-extinguishing materials to the proper location in a hurry is a vital essential in fire-fighting, especially in an oil refinery. Developed principally by William Bacheldor, blacksmith and toolroom foreman at the Wood River refinery, Standard Oil Co. (Indiana) has a foam tower by which foam can be conveyed quickly into a burning tank and onto the surface of the combustible liquid therein, with little if any hazard to the equipment operator.

The unit is built on a five-sided frame of 3 by 6-in. I-beams. The two converging sides in front come to a point, just beneath which two auto wheels are placed on a short axle. The axle pivots on a vertical kingpin moving in a sleeve affixed to the under side of the front of the frame. The parallel sides of the frame are about 5 ft. long. Two similar wheels support the ensemble in rear, about 4 ft. apart, to accommodate the 3-ft. 6-in. wide frame.

The extensible tower main section is an 8-in. pipe 25 ft. long. At the lower end is a heavy counterweight to balance the total weight of the extended tower, the weight being affixed 3 ft. below the pivot axle. The tower section is pivoted on a 2-in. pipe axle on one end of which are a worm gear and crank. This main section of the tower has two inlet pipes welded to opposite sides of the main section, to which are attached two 30-ft. sections of regular foam or fire hose. These attach to the generator to bring in two streams to the main tower section.

### Gears, Cranks Used

A worm gear and crank are fitted to the axle assembly to raise and lower the tower. Another gear and crank are fitted to a stainless steel cable, ends of which are attached to opposite ends of the 6-in. pipe section which is the extension of the main section.

Near the rear end of the main section the extension cable passes through a stuffing box and extends inside the larger section, is welded to the rear or lower end of the smaller diameter section. The stuffing box prevents the foam or other liquid inside from escaping through the entrance hole made for the cable to pass through the wall of the main section. Similarly, the forward or upper end of this cable passes through a stuffing box, down between the smaller and the larger pipe sections and is attached to the rear, or lower, portion of the smaller section. By operating the gear and crank assembly this cable is drawn rearward, to extend the smaller diameter section beyond the larger section until the tower can reach a total height of about 52 ft.

To the open upper end of the smaller diameter extension a semicircular nozzle is attached, near the outer end of which a baffle is inserted, inside, free to move through about 90°, and moving with its movement a short lever attached rigidly to the baffle axle. This lever connects with a chain and key. The key passes through a hole in a long pin which has several holes in its length to fit the dimensions of the apparatus and which controls the action of the Moeller tube described below.

The Moeller tube is of asbestos, 50 ft. long, fastened to a ring which attaches to the end of the curved nozzle tube. When at rest, this asbestos tube is rolled in cylindrical form and rests in a steel box on the tower frame. When in use, its steel ring is affixed to the end of the nozzle tube and the roll rests in a semicylindrical cradle, or basket, just above the nozzle, the cradle pivoting forward and downward when free. Back of this cradle is attached by chain to the drilled pin through which the key passes after the pin is passed through a ring fitted to the nozzle side. This arrangement keeps the cradle in position with its load of asbestos tube.

When taken to a fire, the nozzle, 6 in. in diameter and built on a 15-in. radius, is affixed to the end of the smaller tube by a stop and catch arrangement which locks it in place on opposite sides. The Moeller tube is fitted by its steel ring, the tube still rolled, and this roll is placed in the open cradle described above, so situated that it is retained in the hemisphere of the cradle.

### Crank Raises Tower

The tower is raised by one worm gear and crank, the smaller section is extended within the larger section by another gear and crank, until the top of the tower is above the tank top. The tower is lowered into position so that its nozzle is extended over the burning tank, the Moeller tube still in position. When ready, the two streams from the generators are admitted into the base of the larger section. The stream strikes the baffle in the outer end of the nozzle, which is thrown forward violently, pulling the key from the drilled pin. This pin is pulled forward by the weight of the cradle and its load of asbestos tube and the cradle dumps the tube forward down to the surface of the liquid inside. The foam flows through this tube and spreads out evenly over the burning liquid, laying a smooth, even layer of foam which shuts out oxygen and chokes out the fire.

# Consolidation of Sands in Oil and Gas Wells

**by G. G. Wrightsman* and H. H. Spain***

THE sand members occurring in the Pliocene, Miocene, and frequently those in the Oligocene in the Texas and Louisiana Gulf Coast area are so loosely consolidated that production of oil or gas from them usually is difficult and sometimes impossible or prohibitively expensive. Sand is nearly always entrained in the fluids produced by wells completed in these sands and the quantity almost invariably increases when salt water appears in the well fluids.

At times the flow at allowable rates from a well is insufficient to remove the sand from the bore, so that continued accumulation causes bridges in the casing or tubing and results in a dead well. Production is lost while the well is dead and an expensive cleanout job frequently is necessary to revive flow. When the time arrives that the well must be pumped, cleanout jobs to maintain the equipment in a satisfactory working condition are required more frequently.

The effect on the bottom-hole conditions which results from the production of sand frequently is unrecognized. Sand is produced from the formation opposite the perforated or screened section. Due to their unconsolidated nature, the sands from the adjacent sand body may rearrange themselves to fill the void which tends to form. The permeability of the sand immediately surrounding the well bore is increased. The rearrangement of the sands also causes the permeability perpendicular to the bedding planes to become approximately equal to the permeability parallel to the bedding planes. Thus, the section affected becomes, for practical purposes, a channel between the casing and the formation. These conditions permit the coning of water or gas into the well at a time far earlier than would normal production. If a significant amount of sand has been produced, the extent of the rearranged sand might be very large and make successful remedial operations difficult or impossible.

The high cost of cleanouts, combined with their usually increasing frequency, often leads to well or zone abandonment while recoverable oil remains in the sand. Often the stratigraphy is such that this oil may not be recoverable in other wells on a lease. Thus, the oil may be lost or must be produced from wells on offset leases.

Numerous methods have been devised in attempts to alleviate these difficulties resulting from the production of sand along with the well fluids. The most commonly used device is the screen. Screens, however, are not completely satisfactory because they may become plugged or they may be cut out and rendered ineffective, requiring that the screen be removed to be replaced with a new one. Screen pulling always is difficult and sometimes becomes a very expensive operation. Recently attempts have been made to use porous sleeves prepared from sintered granular materials for the screening media. These materials have not proved themselves to be greatly superior to conventional screens.

### Gravel Packing

In an effort to improve the operation or extend the life of a screen a well may be gravel packed. This practice is far from universally successful because the gravel-packed section may become plugged with mud or fine sand which lowers the productivity of the well. Due to the underreaming necessary to gravel pack a well adequately, the workover operations are greatly complicated.

Therefore, a method for the consolidation of loose sands in which the sand grains are cemented together in such a manner that sufficient porosity and permeability remain to allow the well to be produced at allowable rates would be very beneficial. Such a technique would make possible production from the so-called nonproducible sands, would eliminate the need for frequent cleanout jobs, and would dispose of the dangers of a blowout caused by erosion of well connections. Further benefits would accrue through the elimination of the use of screens by permitting production to be taken directly through perforated casing. Conversely, since no screens would be needed, no screens would have to be pulled. The consolidation of the sand would prevent the shifting and rearranging of the sand and thus simplify the operations and enhance the possibility of success in future workover programs.

To devise a method for the consolidation of sand, the use of plastics

*(Continued on page 84)*

*Production research division, Humble Oil & Refining Co., Houston.

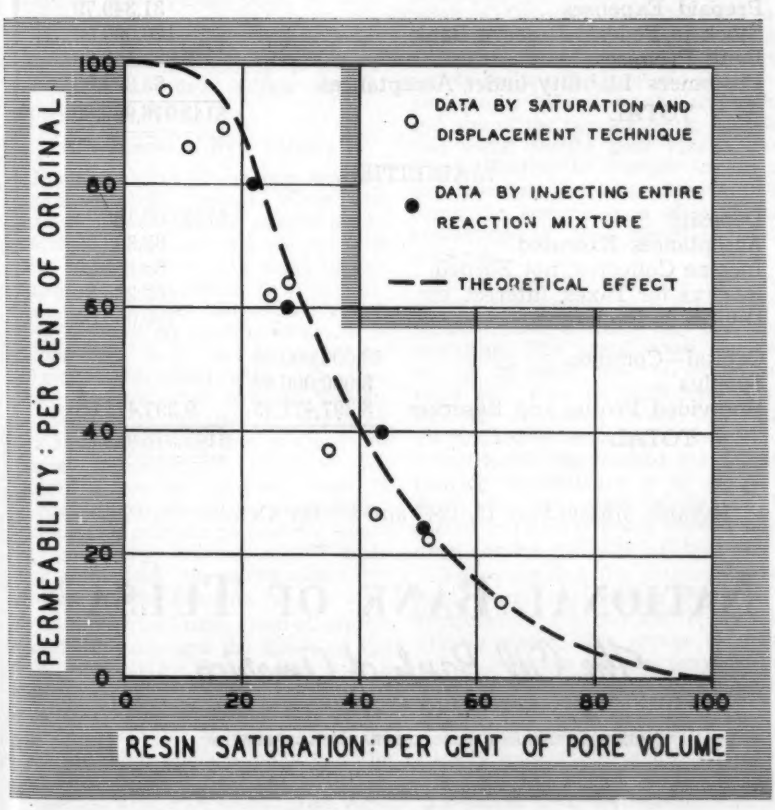



*Fig. 1—Effect of resin saturation on sand permeability*

# STATEMENT OF CONDITION

*June 30, 1947*

## RESOURCES

| | | |
|---|---|---|
| Cash and Due from Banks | $41,606,183.14 | |
| U. S. Government Securities | 70,479,263.87 | |
| Other Bonds and Warrants | 3,536,173.18 | $115,621,620.19 |
| Loans and Discounts | | 25,675,398.46 |
| Overdrafts | | 8,031.92 |
| Income Receivable Accrued | | 304,150.24 |
| Prepaid Expenses | | 31,349.79 |
| Stock in Federal Reserve Bank | | 180,000.00 |
| Bank Premises | | 2,092,500.00 |
| Customers' Liability under Acceptances | | 63,899.00 |
| TOTAL | | $143,976,949.60 |

## LIABILITIES

| | | |
|---|---|---|
| Deposits | | $133,808,185.24 |
| Acceptances Executed | | 63,899.00 |
| Income Collected, not Earned | | 89,158.20 |
| Reserve for Taxes, Interest, etc. | | 468,235.81 |
| Dividends Declared* | | 150,000.00 |
| Capital—Common | $3,000,000.00 | |
| Surplus | 3,000,000.00 | |
| Undivided Profits and Reserves | 3,397,471.35 | 9,397,471.35 |
| TOTAL | | $143,976,949.60 |

*Payable $75,000 July 15, 1947 and $75,000 October 15, 1947

**NATIONAL BANK OF TULSA**

*The Oil Bank of America*

MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

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# PROGRESS IN METALS

*by W. L. Nelson*

Consulting Engineer

## How to Pour Bearings

FUNDAMENTAL in the making of good bearings is the selection of an alloy having the proper physical properties, hardness and compressive strength, freedom from segregation, and good grain structure. Aside from the fact that the selection of such an alloy is a necessity in order to secure dependable, long-life bearings, the procedure followed in casting is also tremendously important if good bearings are to result. Even the best babbitt can fail in service if a few fundamental pouring rules are not followed.

There are many ways in which bearings can be poured, with assurance of equally good results. However, experience has proved that if the basic principles of heat transfer from molten metal through the bearing shell are observed, good bearings with lining tight against the shell should be obtained, regardless of the particular setup or method that is followed. The average plant or shop usually has or can readily devise the equipment and fixtures that are required. From this point on, it is only necessary to follow a few simple, fundamental rules.

### Advantages of New Babbitt

It always pays to use new babbitt, made of virgin metals. When you have decided upon the proper grade for the service involved, do not mix with reclaimed or scrap metal of unknown analysis. While it might appear that reusing old metal is one way to save on bearing costs, it is seldom wise to try and economize by mixing used metal with new. Too often dirt or other harmful foreign matter will be included, or metals of unlike analysis may not produce the dense, close-grained structure required successfully to resist wear. If a sizable quantity of old metal is accumulated, this can be used for pouring secondary bearings where loads are light and the performance required is less exacting.

Using a wire brush, clean all equipment, fixtures, and the inside of the shell thoroughly. Follow this with a blowtorch and further brushing if necessary. The blowtorch also serves to drive out all moisture from the bearing shell, which is important. The mandrel should be as thin walled as possible, with ends closed with wood plugs to prevent heat loss.

Put a waste head on top of the shell. This takes care of the problem of shrinkage as the bearing solidifies, assuring sufficient metal to fill completely the bearing area. The waste head is made of a putty-like substance that is especially prepared for the purpose, and as it does not dry out, it can be used over and over again. The height of the waste head depends upon the size of the bearing, larger bearings requiring more excess metal at the top to make up for shrinkage.

Before you start to melt, make sure that you have sufficient babbitt to pour the entire bearing at one time. This is necessary in order to secure a dense and completely uniform structure. The melting pot should be placed close to the work. This will prevent heat loss in ladle as the molten metal is transferred from the pot to the bearing fixture.

### Best Pouring Temperature

Follow the manufacturer's recommendation for correct pouring temperature. Generally speaking, a temperature of from 850° to 950° F. is sufficient. After the babbitt is completely molten, the best pouring temperature is related to the thickness and size of the bearing being poured. The metal should pour almost like water. Heating to a slight excess is not harmful, the only disadvantage being the accumulation of a higher percentage of dross resulting from oxidation.

Thick, heavy bearings can be poured successfully at a lower temperature than bearings that are long and thin. The metal must be hot enough to reach the bottom of the mold and start to build up before any sign of setting occurs. One simple method of checking to determine if the metal has reached the correct pouring temperature is to insert a small, dry pine stick in the pot. It should burst into flame immediately upon contact with the hot babbitt.

Before starting the pouring operation, warm the bearing shell to a temperature of about 200° F. As previously stated, this serves to drive out all moisture and also prevents too quick or nonuniform solidification of the molten metal.

Fill the space completely and as rapidly as possible, continuing pouring until the top of the waste head is reached. Cool the bearing shell by applying water or wet rags, starting at the bottom and working slowly upward. By thus drawing the heat outward, the metal starts to solidify at the inside surface of the shell, adhering tightly to the wall. As the babbitt sets and contracts in this area, the void is filled with hot metal from the mandrel side, which in turn is fed from the surplus metal provided by the waste head at the top of the shell.

When the metal has completely cooled and set, if the bearing has been properly poured, the mandrel should not stick but should free itself from the fixture with little effort.

While conditions and facilities will vary from shop to shop, nevertheless, if the foregoing simple, basic rules are followed there is no reason why every bearing produced should not be sound, dependable, and capable of giving the long, trouble-free service that is expected of it.

This discussion was prepared by K. T. MacGill of Joseph T. Ryerson & Son, Inc., and appeared in the February 1947 issue of Materials and Methods.

## Alloy-Steel "Subs"

THE "subs" as well as most parts of a drill string are subjected to extreme stresses, shocks, overloads, and general abuse. The term sub in oilfield vernacular refers to a tool-connecting joint or reducer which is threaded internally and externally, or flanged so that the ends can be coupled to drill collars, tool joints, or bits.

Those manufactured by Houston Oil Field Material Co. are made of nickel-chromium steel S.A.E. 3140:

| | |
|---|---|
| Carbon, per cent | 0.35-0.45 |
| Manganese | 0.60-0.90 |
| Phosphorus (max.) | 0.04 |
| Sulfur (max.) | 0.05 |
| Nickel | 1.0-1.5 |
| Chromium | 0.45-0.75 |

which is heat treated to a hardness of 285-304 Brinell. Such a material exhibits a strength of about 150,000 psi.

## Metallurgical Terms

### Slab and Slabbing Mill

A very thick rectangular piece of steel which is to be used for rolling down into plates is called a slab; the heavy plate mill required for this purpose is called a slabbing mill.

### Semisteel

Semisteel may be defined as a ferrous material that contains an amount of carbon which is intermediate between that for a true steel and that for a typical cast iron. Such a material is usually produced by melting one-third to one-fifth by weight of soft steel scrap with cast iron.

*These members of the laboratories administrative group are charged with direct supervision of Magnolia's research program. They are, seated: J. P. Minton, research adviser; T. W. Nelson, director, and D. H. Clewell, assistant director of exploration research. Standing are H. A. W. Kidd, administrative assistant, and T. A. Pollard, supervisor of production research*

**by George Weber**

# Magnolia Research Program

## DIRECTED TO PROBLEMS OF CRUDE SUPPLY

A LONG-RANGE research study outlining a broad base of fundamental study is now under way at the field research laboratories of Magnolia Petroleum Co. at Dallas. Dealing exclusively with the related fields of exploration, drilling, and production, the Magnolia project will form an important integrated part of the total postwar research of companies in the Socony-Vacuum group.

The granting of major status to field research reflects the company's mounting concern over current and prospective costs of finding, developing, and producing crude oil. The new research program on the more basic problems of crude supply will tend to balance the present research emphasis on petroleum-manufacturing problems. Magnolia's progressive approach will stress fundamental studies of established techniques and the application of war-born tools and methods in an effort to improve both discovery and recovery rates.

During the war years, Magnolia greatly expanded its Dallas laboratories to meet the emergency demand for new high-octane aviation fuels. Intensive work was done on various superfuel constituents and catalysts. A major project was the further development of the HF alkylation process, and Magnolia research is credited with a leading role in alkylation study.

On completion of wartime assignments which stressed refining and petrochemistry, a coordinated program of research was instituted by Socony-Vacuum companies. Process research is now consolidated at the Socony-Vacuum research and development laboratories at Paulsboro, N. J., and product testing and evaluation will center in the Socony-Vacuum technical service laboratories in Brooklyn. Relieved of all study concerned with processing and products, the Magnolia laboratory is now converting to the large-scale field program.

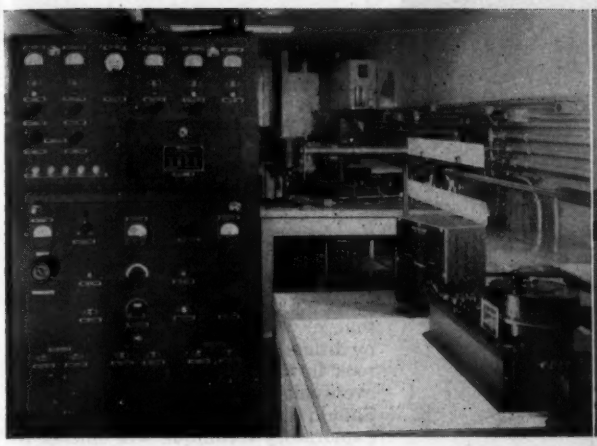
### Physical Layout

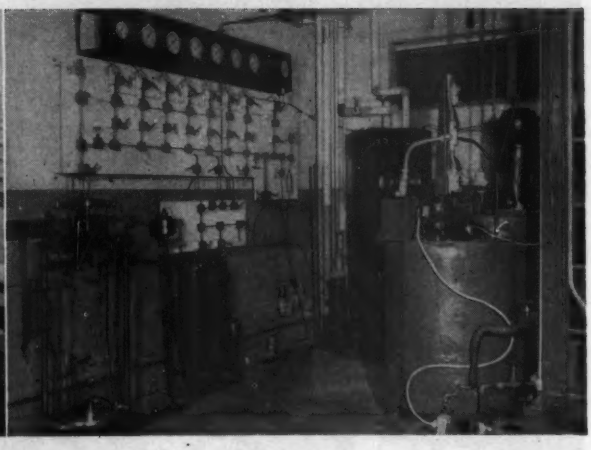
The laboratory's location in open country 10 miles southwest of Dallas provides a good degree of isolation from vibration and electrical interference and permits on-the-spot studies with extremely sensitive instruments. The 20 buildings housing laboratories, shops, offices, and a combination cafeteria and lecture room are well integrated on 40 of the laboratory's 140-acre site. Grounds outside the building area provide both protection from encroachment and space for field testing of instruments and techniques. Work of the laboratories is supplemented by field studies on the company's producing properties.

As regards shops and utilities, the research center is unusually self-sufficient. Equipment and skills are available for all laboratory needs ranging from general maintenance to extremely precise instrument design and fabrication. Scientific orderliness extends to the shops which are uncluttered, well lighter, and painted according to modern safety requirements. Air conditioning for employe comfort and scientific control has been installed in some buildings and all other major buildings will be so equipped in the near future.

The physical plant offers space for increasing the present research program. A heavy investment in equipment, and approval of long-range, basic studies reveal a far-sighted attitude on the part of management. This combination of facilities and intentions places Magnolia in a favorable position for major field research in the future.

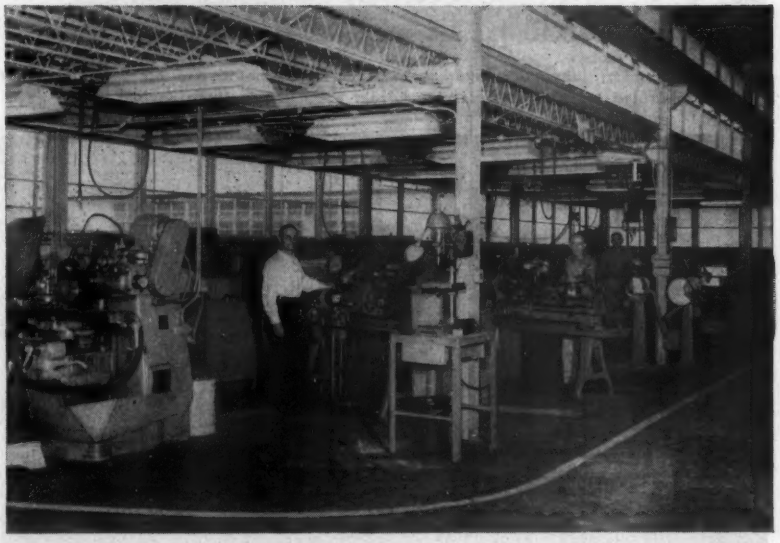
Management control of the laboratories is administered by Magnolia's S. A. Thompson, vice president and manager of exploration, and Henry C. Cortes, assistant manager of exploration. T. W. Nelson is director of the laboratories and D. H. Clewell is assistant director.





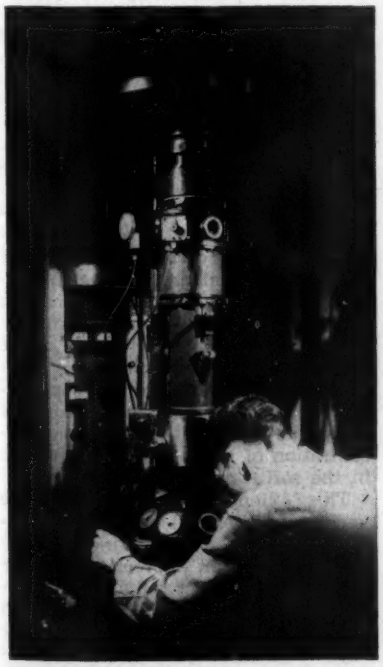
*Above, left: The mass spectrometer is one of many newly developed analytical instruments now employed in the Magnolia laboratories. This type of spectrometer indicates the molecular weight of hydrocarbons in samples under examination*

*Above, right: Section of P.V.T. lab where reservoir conditions are duplicated in cells housed in constant-temperature baths. Control and distribution are handled by panel on left wall*



*Right: Principal machine shop fabricates relatively heavy equipment, while a smaller precision shop turns out instruments used in exploration and production studies*

*Below: Electron microscope finds particular use in observing particle size, shape, and dispersion in the drilling-mud research project. By subsequent enlargements of photos, magnification on order of 100,000 diameters is possible*



**Exploration Projects**

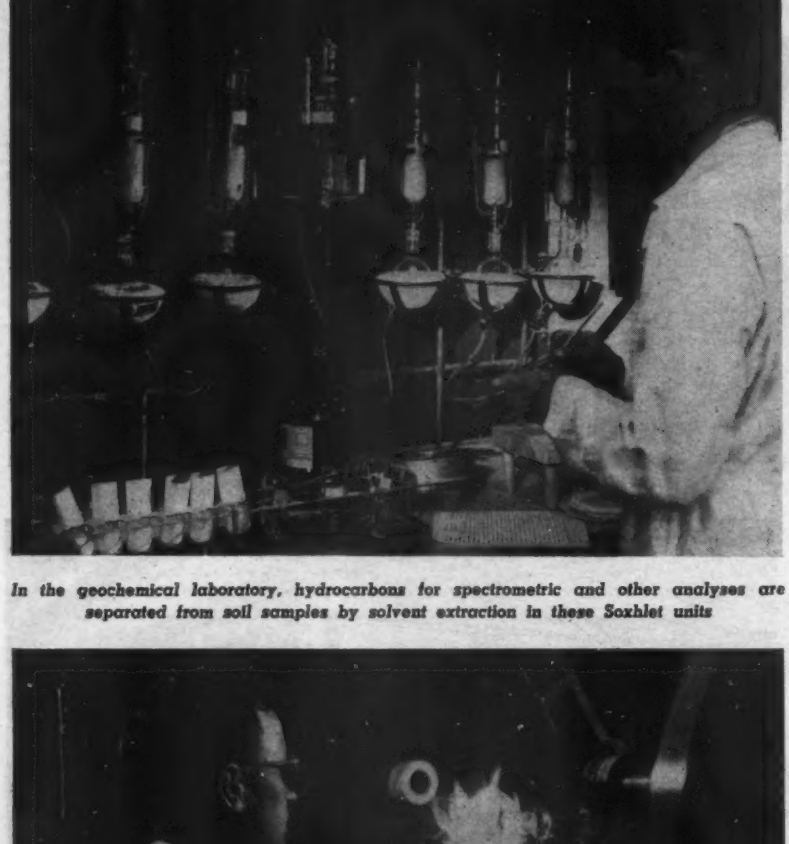
The most comprehensive program now under way concerns exploration. Here the policy of combining basic study with development of new tools, is well illustrated. The exploratory program is extensive, including all known methods for locating subsurface accumulations of oil and gas.

An ambitious project is outlined for geophysics alone. Concern for improvement in seismograph methods and procedures has prompted management to order a thorough study of the fundamentals of wave propagation through subsurface formations. This investigation is expected to produce both short and long-range results.

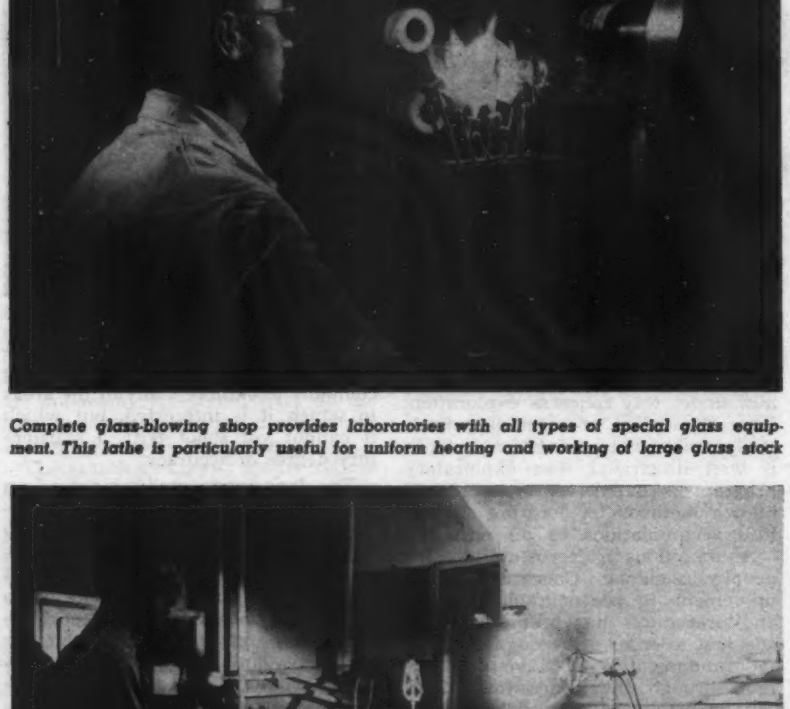
The short-range category includes an intensive study of shock waves through unconsolidated deposits occurring near the surface. Determining the nature and extent of such random waves would allow their elimination in interpreting seismograph records, extending practical application of that type of exploration to areas overlain by shallow loose deposits or hard rock. This accomplishment alone would allow the company to explore many of the areas in which it is interested, but which it cannot yet shoot with a satisfactory degree of accuracy.

The long-range study involves an open-minded re-evaluation of geophysical interpretation, coupled with development of geophones of improved characteristics. The results of this extended project are expected to provide engineers with the most effective type of record obtainable for all areas, and a better understanding of what such records indicate.

Electrical exploration will receive attention at the Magnolia laboratories. Although this method has long had interesting theoretical possibilities, no operating technique has yet been developed that is accepted widely by the industry. Electric currents emanating from surface or subsurface electrodes are known to be influenced by subsurface formations. But practical use of this principle involves a number of knotty problems. Random surface currents must first be filtered



*In the geochemical laboratory, hydrocarbons for spectrometric and other analyses are separated from soil samples by solvent extraction in these Soxhlet units*



*Complete glass-blowing shop provides laboratories with all types of special glass equipment. This lathe is particularly useful for uniform heating and working of large glass stock*

*The Baird three-meter spectrograph is employed in analysis of soils and other solids. Samples are vaporized in a carbon arc and the light is refracted by a fine grid into a spectrum whose range includes infrared, visible, and ultraviolet bands*

out before weak effects from deeper formations can be picked up. Once this is accomplished, extremely sensitive instruments will be needed to measure such effects quantitatively. Recent progress in electronics may afford researchers the needed tools for results along those lines.

Proper interpretation of the measured electrical potentials then arises. The attack on these successive problems has begun with the study of theory and with instrument development. Preliminary results indicate that electrical energy that has been modified by oil, water, and various rock formations at considerable depth eventually may be distinguished. Should that end be realized, a new exploratory technique will emerge for use independently or as a valuable adjunct to the seismic method. Laboratory studies of both seismic and electrical methods are being supplemented by field applications on known structures.

### Geochemical Studies

Recent improvements in precise analytical instruments have revived interest in geochemistry, and studies of soil analysis and other related subjects have been resumed at the Magnolia laboratories. Geochemical research is being both broadened and extended. The relationship of hydrocarbon seepage to surface topography, water tables, vegetation, and geology is under investigation in an effort to establish the meaning of parameters which appear when such data are plotted for known and possible producing areas. Use of new analytical techniques carries soil and rock analysis to limits not approached by previous analytical methods. The laboratories are experimenting with solvent extraction of soil samples. In addition, experiments are being conducted in the collection of surface hydrocarbons on a smaller scale by extended exposure of absorbing agents placed at intervals over areas under study.

The analytical section of the laboratory includes spectrometers which indicate minute quantities of hydrocarbons quantitatively and qualitatively. The infra-red spectrometer reveals types of carbon linkages; the intensity of bands in the spectrum indicating the concentration of carbon compounds in the sample analyzed. This finding, coupled with that of the mass spectrometer which gives a qualitative analysis of hydrocarbons according to molecular weight, forms a composite picture of the type and concentration of hydrocarbon compounds in the soil sample.

This extended effort to evaluate various geochemical data and rationalize all into a workable index is undertaken with an appreciation of the results, or lack of results, of past research on that subject. To critics who may feel that measuring and studying such minute quantities of hydro-

carbons amounts to hair splitting, researchers answer that so long as the method indicates some merit, they cannot afford to overlook it.

A comprehensive evaluation of drilling muds will occupy an important place in the production division of the laboratories. This project was undertaken because of the growing realization that mud of improper constitution or the right mud incorrectly used can cause trouble in well completions.

Despite the added attention given to mud in the recent past, researchers still feel a lack of fundamental knowledge of the character and behavior of specific types of clays. Accordingly, the effort is based on an underlying study of all known commercial mud components, both natural and synthetic. In addition, weighting materials and the oil constituents of oil-base muds are under examination.

Here again, new tools aid the work. An X-ray diffraction apparatus and an electron microscope allow the actual observation of shape, size, and dispersion of individual clay particles in colloidal mixtures. These instruments are also used analytically to identify those types of clay showing the most desirable properties in drilling fluids.

A full-scale testing program is scheduled. Moisture content, hydration pressure, and filtration and colloidal properties of all clays are some of the factors that will be studied. This basic work is designed not only to determine what mud components are desirable, but to develop evaluation methods and tests that are correlative with field operation.

The study of mud components will not be restricted to those now available, since it will include examination of possible new additives. In this respect the extensive war work on development and manufacture of clay catalysts gave Magnolia scientists a new insight into clays and clay behavior. The basic study of thixotrophy, ion exchange, swelling, and other phenomena which govern the behavior of clays in drilling use, will be conducted on established and prospective mud components. With their technical experience in the difficult steps of concentrating certain components of natural clays and the manufacture of synthetic materials, the laboratories hope to develop new improved drilling muds tailored to specific uses.

### Reservoir Behavior

On the subject of reservoir mechanics, considerable attention is to be concentrated on multiphase flow problems. Once again, scientists are turning to basic work on flow of fluids through porous media, and the effects of relative permeability on two and three-phase flow characteristics. Extension of these fundamental investigations to laboratory and field application will be conducted with existing tools and methods. In addition, the use of radioactive tracers in oil is being considered. Other studies in reservoir mechanics will concern porosity, methods of core mounting, determination of interstitial water, and elastic properties of reservoir rock.

Another phase of basic study will center in the P.V.T. laboratory where new precision instruments and visual cells will enable observers to correlate existing P.V.T. data. Other efforts of the instrument shops will include attention to the need for improved subsurface pressure gages. Separators are coming up for specific consideration in an effort to improve their performance. Particular attention will be paid to the breaking of gas foams which limit oil-well pump and separator efficiency.

A four-story welded-steel superstructure, erected to suspend long columns for delicate fractionation experiments now completed, may be used in the proposed fabrication of a "well above ground." Plans for devising this laboratory model simulating subsurface conditions are still in the formative stages.

Magnolia's rapidly expanding research program in exploration and production will constitute an important part of the industry's progressive effort to improve on the present record of wildcat success and on current oil-recovery efficiencies.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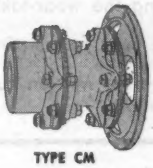
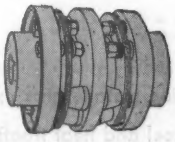
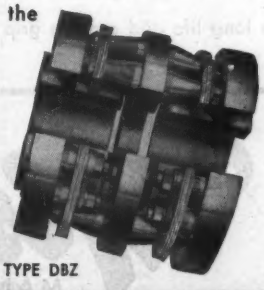
Pipe Line Men know that Thomas "Flexible" Couplings on their Low or High Speed Pumps give 100% dependable service.


TYPE CM

Drilling Engineers get the most out of their equipment with Thomas "Flexible" Couplings on Engine, Gear and Mud Pump Drives.


TYPE DBZ-B

In the Laboratory Thomas "Flexible" Dynamometer Couplings assure the greatest accuracy.


TYPE DBZ

Thomas Flexible All-Metal Couplings Have No Wearing Parts.
BACKLASH, FRICTION and CROSS-PULL ARE ELIMINATED.

NO LUBRICATION IS REQUIRED!

Write for the new Engineering Catalog

THOMAS FLEXIBLE COUPLING CO.
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## Examples of
## MISSION LEADERSHIP IN
## *Metallurgy and Heat Treating*

To solve the problem of rod breakage and the resultant damage to pump, Mission instituted an intensive search for the steel with the best possible combination of strength and toughness. Extensive tests by Mission metallurgists resulted in the tough high-strength Mission rod that bears the Mission special guarantee which covers damage to the pump as well as replacement of the rod.

Steel requirements for maximum hardness differ from those for maximum toughness. The Mission Silver Top Valve design permits making the wear-taking bushing for maximum hardness and the valve seat for maximum toughness. This results in better valve service for Mission customers.

Mission metallurgists experimented with hundreds of combinations of steel and heat treating to get the greatest practicable hardness of Mission slip dogs. This extreme hardness is your assurance of the long life and positive grip of Mission slips.

CORRECT STEELS — CAREFULLY HEAT TREATED, CONTRIBUTE TO THE SUCCESS OF THESE MISSION PRODUCTS
SOLD THROUGH SUPPLY STORES EVERYWHERE

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# Carbon-Hydrogen Ratios of Distillate Fuel Oils

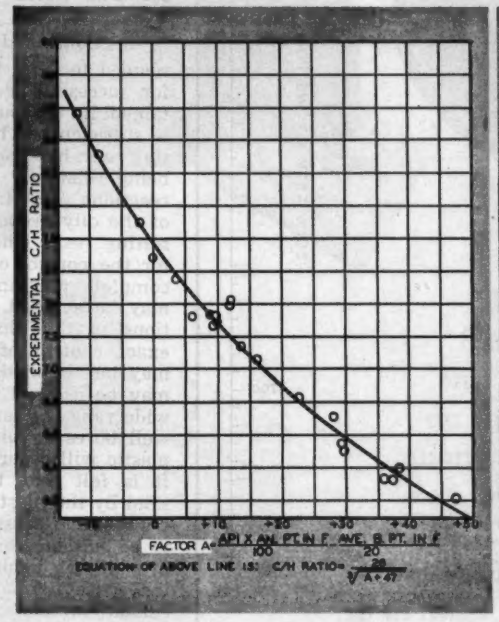
*by S. P. Cauley* and E. B. Delgass†*

USE of the pure hydrocarbon C/H ratio correlation in comparative fuel composition, cracking, and combustion studies has been extremely valuable, but not sufficiently accurate for combustion calculations involving distillates. Since it is always desirable to work with absolute values, wherever possible, a program was instituted to develop a similar correlation specifically for distillate fuel oils.

A group of 22 samples having distillation slopes (using 10 per cent and 90 per cent points) ranging from 0.2 to 4.56, and 50 per cent points ranging from 430° to 671° F. were selected for study, so as to cover the whole range of distillate fuel oils that might be produced at a refinery. The samples were carefully analyzed for their carbon and hydrogen contents, and results obtained are given in Table 1, with physical properties of the test fuels.

From these data it was found that the "A" factor used in the pure hydrocarbon C/H ratio correlation [A = diesel index — (0.05 × A.S.T.M. 50 per cent point)] when plotted against actual C/H ratios also gave a good correlation (Fig. 1). The equation of this line was determined by loga-

*Product engineer, gasoline and fuel-oil department, Socony-Vacuum Oil Co., Inc., New York. †Supervisor, product engineering division, Technical Service Laboratories, Socony-Vacuum Laboratories, Brooklyn.



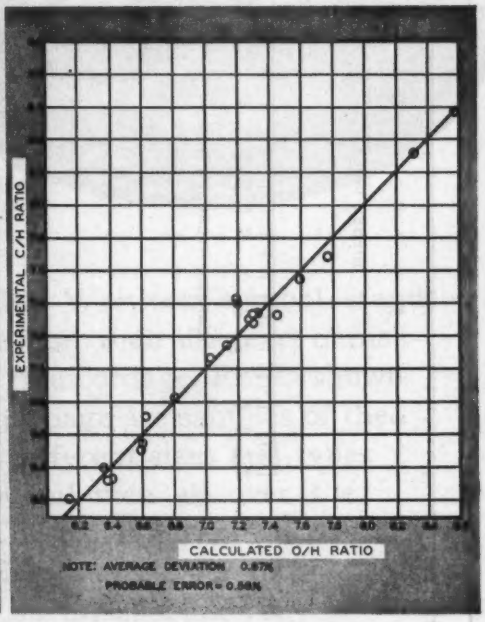




*Fig. 1—(Left) Correlation of C/H ratio vs. "A" factor. Fig. 2—(Right) Comparison of calculated and experimental C/H ratios*

**TABLE 1—PHYSICAL PROPERTIES AND CARBON-HYDROGEN RATIOS OF TEST FUELS**

| | | Physical properties | | | | | | Results of carbon and hydrogen analyses | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Average deviation | | |
| Sample No. | Description of sample | °A.P.I. | A.S.T.M. aniline point | Diesel index | A.S.T.M. 50% boiling point | "A" factor (Note) | A.S.T.M. 10%-90% dist. slope | Avg. C/H ratio | % C | % H | No. of determinations |
| 1 | A.S.T.M. ref. fuel No. 1* | 37.9 | 138 | 52.3 | 463 | 29.2 | 1.71 | 6.54 | .05 | .21 | 5 |
| 2 | A.S.T.M. ref. fuel No. 2* | 28.7 | 117.3 | 33.7 | 505 | 8.5 | 2.09 | 7.32 | .18 | .24 | 5 |
| 3 | T.C.C. distillate | 25.9 | 111.7 | 28.9 | 515 | 3.2 | 1.30 | 7.55 | .12 | .04 | 2 |
| 4 | Res. Houdry cut and gas oil | 21.9 | 179.6 | 39.3 | 671 | 5.8 | 1.64 | 7.32 | .06 | .04 | 2 |
| 5 | Houdry recycle stk. and gasoline | 31.0 | 126.9 | 39.3 | 554 | 11.6 | 3.63 | 7.40 | .23 | .25 | 2 |
| 6 | Houdry recycle stk. and gasoline | 33.4 | 133.9 | 44.7 | 574 | 16.0 | 4.56 | 7.06 | .16 | .29 | 5 |
| 7 | Houdry recycle stk. | 21.4 | 83.8 | 17.9 | 534 | —8.8 | 1.79 | 8.31 | .21 | .01 | 2 |
| 8 | Houdry recycle stk. | 27.6 | 137.5 | 37.9 | 575 | 9.2 | 1.84 | 7.37 | .08 | .01 | 2 |
| 9 | Residual Houdry cut and gas oil | 18.4 | 88.7 | 15.67 | 559 | —12.2 | 2.36 | 8.56 | .29 | .04 | 3 |
| 10 | T.C.C. distillate | 28.4 | 121.3 | 34.4 | 503 | 9.3 | 1.61 | 7.33 | .20 | .10 | 2 |
| 11 | Diesel fuel | 36.6 | 151.7 | 55.5 | 517 | 29.7 | 2.00 | 6.50 | .33 | .03 | 2 |
| 12 | Cold No. 5 fuel oil | 21.7 | 128.7 | 29.2 | 590 | —0.3 | 3.02 | 7.68 | .38 | .06 | 3 |
| 13 | Special blend | 28.9 | 135.8 | 39.2 | 548 | 11.8 | 2.89 | 7.42 | .05 | .03 | 2 |
| 14 | Kerosine | 41.8 | 143.2 | 59.7 | 430 | 38.2 | 1.25 | 6.40 | .02 | 0.1 | 2 |
| 15 | Houdry distillate | 29.6 | 131 | 38.8 | 510 | 13.3 | 1.06 | 7.14 | .09 | .17 | 2 |
| 16 | Blend: 2 and 15† | 35.3 | 129.9 | 45.8 | 464 | 22.6 | 1.76 | 6.83 | ... | ... | .. |
| 17 | Blend: 6 and 15† | 36.9 | 138.5 | 51.1 | 462 | 28.0 | 3.64 | 6.71 | ... | ... | .. |
| 18 | Blend: 3 and 6† | 29.5 | 124.1 | 36.6 | 535 | 9.9 | 2.83 | 7.30 | ... | ... | .. |
| 19 | Blend: 2 and 10† | 23.5 | 102.9 | 24.15 | 529 | —2.3 | 2.28 | 7.90 | ... | ... | .. |
| 20 | Tibu crude cut | 36.6 | 176.5 | 64.6 | 574 | 35.9 | 0.20 | 6.33 | .13 | .02 | 3 |
| 21 | Tibu crude cut | 48.4 | 134.4 | 65.0 | 350 | 47.5 | 0.43 | 6.21 | .04 | .05 | 3 |
| 22 | Tibu crude cut | 39.4 | 155.7 | 61.3 | 462 | 37.2 | 0.51 | 6.32 | .08 | .01 | 3 |

(Note): $A = D.I. - \frac{\text{A.S.T.M. 50\% pt.}}{20}$

*Reference fuels used in combustion test program of A.S.T.M. D-2, Technical Committee E, Section 2. †The four blends (Nos. 17 18, 19 and 20) consisted of 50 per cent by weight of each of constituents indicated.

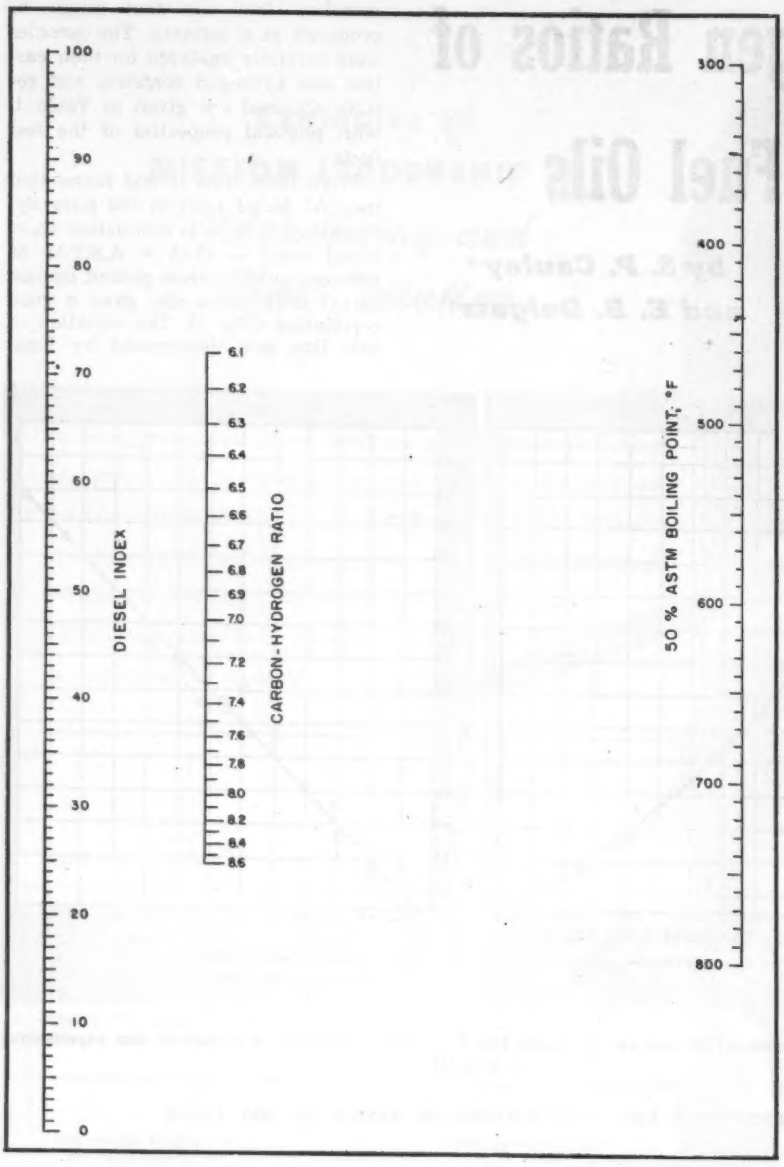



*Fig. 3—Related properties of distillate fuel oils*

rithmic plotting, and found to be:

$$\text{C/H Ratio} = \frac{28}{\sqrt[6]{A + 47}}$$

An indication of the accuracy of this correlation is shown in Fig. 2. The average deviation of estimated from actual C/H ratio was found to be 0.89 per cent and the maximum deviation was 3.27 per cent. The probable error on the basis is 0.83 per cent. If results of Samples 5 and 13 were discarded, which action is mathematically justifiable, this would give an average deviation of 0.67 per cent, and a probable error of 0.58 per cent.

A nomograph fitting the above equation has been prepared for the sake of convenience, and is given in Fig. 3. To use this, a straight line is drawn joining diesel index and A.S.T.M. 50 per cent point of the fuel in question, and the answer is read at the intersection of this line with the C/H ratio scale.

On the basis of degree of accuracy obtained and wide variations in the fuels studied, it is believed that the correlation shown in Fig. 3 should be quite useful to engineers dealing with distillate fuel oils.

**IN a previous paper by the authors, "Carbon Hydrogen Ratio of Catalytically Cracked Distillate Fuel Oils" (The Oil and Gas Journal, July 27, 1946), a correlation of carbon-hydrogen ratios of pure hydrocarbons with their properties of A.P.I. gravity, aniline point, and boiling point was presented, along with its application to studies of catalytically cracked fuel oils. It was recognized that this correlation would not give true C/H ratios of distillates when substituting an A.S.T.M. 50 per cent point for the boiling point of a pure hydrocarbon, but sufficient data were available to show that the indicated C/H ratio obtained by this substitution and the true C/H ratios had sufficient relation to each other to justify use of the correlation in comparative fuel studies.**

# Consolidation of Sands In Oil and Gas Wells

*(Continued from page 73)*

seemed to offer the greatest promise for success. The heat normally contained in the subsurface formations is sufficient to harden a thermosetting resin in reasonable time, pressure being relatively unimportant in the reactions. The true liquid character of the oily prepolymer of a thermosetting resin lends itself to methods for the control of saturation so that complete plugging of the formation may be avoided. The chemical reactions of the plastics are such that exact control of rate of hardening may be obtained. Thus, formulations may be devised to accommodate the wide range of temperatures found in well bores so that hardening of the plastic will occur in reasonable time. It is felt that the wetting of the sand by the plastic is vital to a process for sand consolidation. A material to be suitable for use must have the property of displacing and occupying the space normally occupied by the connate water that wets the sand grains. This property may be obtained by choice of suitable formulations or by admixing with the resin an adequate wetting agent.

### Application of Method

A method for consolidation of sands* was developed which utilized a liquid polymer of a phenol and formaldehyde that either possessed the ability or could be modified to wet the sand and displace the connate water. To apply this method, the sand first is saturated with the liquid resin and before time for hardening has elapsed the excess resin is flushed from the sand by a neutral fluid such as oil, and in this manner the porosity and permeability are retained. The resin that is left in the sand is hardened by the heat of the formation. Experiments have shown this technique to be suitable for the consolidation of sands and that the degree of consolidation is roughly proportional to the quantity of resin that remains in the sand. It has been found that the lowest saturation of resin able to give a firm consolidation

*G. G. Wrightsman and S. E. Buckley, U. S. Patent 2,378,817, June 19, 1945, assigned to Standard Oil Development Co.

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is about 15 per cent of the pore volume.

A number of laboratory tests were made to determine the effect of the residual resin saturation on the permeability of the sand. Sand tubes were prepared and saturated to simulate oil or water sands. The resin was forced into the sand and immediately the flushing fluid was flowed through the sand until the desired resin saturation was obtained. The tube was then heated to cause the resin to harden. After time for the resin to harden had elapsed, the permeability of the treated sand was measured. Fig. 1 shows the residual permeability as a function of the resin saturation of the treated sand. Also shown for comparison is a curve called "the theoretical effect" which was taken from data on the effect of water saturation on the relative permeability of a sand to oil. It may be observed that the decrease in sand permeability for a given resin saturation is quite similar to the decrease of relative permeability of a sand to oil for a given water saturation. These data show that the resin actually occupies the portion of the pore space normally occupied by water and that the resin wets the sand.

The method just described for the consolidation of sands depends for the retention of porosity and permeability of the sand upon a fundamental fact of fluid flow through porous media that may be stated thus: It is impossible to remove completely a fluid which wets the sand by flowing through the sand a second liquid in which the first is insoluble.

A different mechanism for the retention of permeability consists in introducing into the sand a fluid mixture which reacts to separate into two phases, one of which is reactive, wets the sand, and forms a solid, and the second of which is liquid and inert to further reaction.† Such a solution may be prepared from a phenol and a molar excess of formaldehyde solution in the presence of a catalyst. For instance, one part of phenol dissolved in four parts of formaldehyde solution reacts in the presence of a catalyst to produce a hardenable resin amounting to about 30 per cent of the volume of the original solution; the other 70 per cent by volume is inert to the reaction. Stannous chloride was chosen for the catalyst because the resin precipitated from the solution wets the sand without addition of special wetting agents.

### Obtaining Precise Control

The quantity of hardenable resin produced relative to the volume of the original solution is roughly proportional to the ratio of the phenol fraction to the formaldehyde solution. Thus, precise control of the resin saturation in a sand may be obtained and the quantity of resin may be varied from 15 per cent to 70 per cent of the pore space. A two-stage treatment is usually used for sand consolidation.

Two means are available to control the rate of the reaction in a temperature range from 105° to 250° F. First, an admixture of varying proportions of a fast-acting phenol, such as cresol or resorcinal, may be made with a slow-reacting phenol, such as phenol itself. Second, the concentration of the catalyst may be varied.

Numerous laboratory tests have been conducted to test the effect on the permeability of the sand after treatment by this method. The permeability of the treated and untreated sand was measured as in the other method. The results of these tests are included in Fig. 1 and lead to the same conclusions previously drawn.

To test the physical properties of a sand after consolidation with two stages of treatment, sand recovered during a drill-stem test was packed in a tube, saturated to simulate an oil sand, and treated for consolidation. Initially the sand had 36.9 per cent porosity, 11.9 darcys permeability, and 9.7 darcys permeability to oil at 21 per cent water saturation. After treatment with two stages of the consolidation resin solution, during which 39.5 per cent of the pore space was filled with resin, the per-

†Patent applied for.

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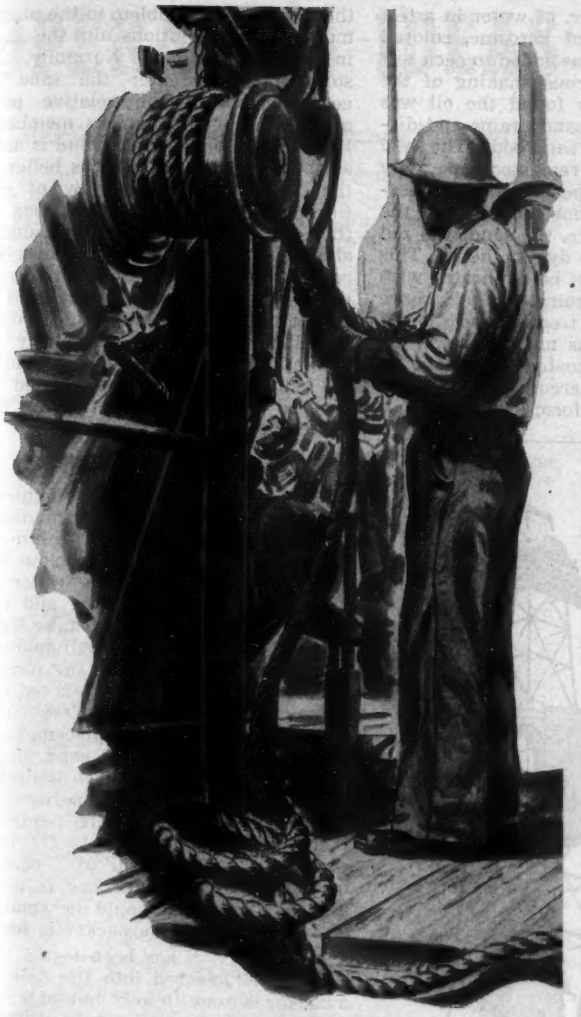

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meability was found to be 3.1 darcys or 28.4 per cent of the original value. The compressive strength of the treated sand was found to be 1,850 psi.

### Wetting Character of Resins

It should be pointed out for emphasis that it is felt to be fundamental to any successful process for the consolidation of sands that the resin, or binding material, wet the sand preferentially to any other fluid in the system. The wetting character of the resins used to consolidate the sands was demonstrated in the following experiments. Samples of sands which had been consolidated were ground to grain size. Five cubic centimeters of the resulting sand grains were suspended in 15 cc. of water in a test tube and 1 cc. of kerosine, colored red with a dye, was added to each test tube. After vigorous shaking of the test tube, it was found the oil was absorbed on the sand grains and disappeared into the sand body. The sand grains no longer remained separately dispersed but appeared to agglomerate, indicating that the oil wet the sand. Furthermore, the sand was red in color from the dye in the oil. This behavior could not be duplicated with untreated sand grains. The adherence of oil to the resin treated sand showed that the sand was no longer wet by water but was coated by plastic to which the oil adhered.

Obtaining uniform saturation is the most serious problem in the placement of these solutions into the sand in an oil or gas well. Normally, the solution should enter the sand in accordance with the relative permeabilities of the various members. However, in wells where mud is used as the circulating fluid, it is believed that the resistance to flow of the filter cake deposited at the face of the formation governs to a considerable degree the effective over-all permeability of the system. So long as break-down pressures are avoided it is felt that the treating fluid enters the sand sufficiently uniformly to accomplish consolidation, provided the entire section to be treated is covered with the solution before injection is started.

### Preparation of Well

To prepare a well for treatment, any excess sand that has accumulated in the casing is washed out with mud. The tubing is held at or below the bottom perforation while water is spotted over the sand face and the ability of the formation to take fluid is tested by injection of small amount, 1 or 2 bbl., of water into the formation. Care is taken not to exceed the "break down" pressure. Frequently no packer is used in the placement of the resin solution into the sand. However, if the formation test indicates the sand to be extremely permeable, or that high pressures are required, then it is advisable to make the displacement with the aid of a packer on the tubing. If a packer is used, the resin solution should be spotted on bottom before the packer is set.

After the well has been tested and the packer lowered into the hole, if a packer is used, 10 to 20 bbl. of water are pumped into the tubing. This water is used to wash the mud from the bottom of the hole. The water is followed immediately with the resin solution, ½ to 1 bbl. of water, 5 to 10 bbl. of a low-filtration mud, and then mud to spot the resin solution on bottom with enough in the annulus to cover the interval to be treated. The casing valve is closed, or the packer is set if one is used, and the desired volume of resin solution is injected into the formation at a pressure not to exceed that used to test the well.

This pressure is allowed to bleed down, the casing is opened, or the packer is unseated, and enough mud is pumped into the tubing to spot the low-filtration mud over the treated formation. One to two stands of tubing are pulled and the well washed clean by reversed circulation with mud. The well then is allowed to stand undisturbed to allow the resin to separate and harden. The second stage of the treament is made in the same manner. Usually, the two-stage treatment requires 48 to 72 hours to complete; however, the tubing may be run, the mud displaced, the tree set, and the well made ready to produce before the end of this time.

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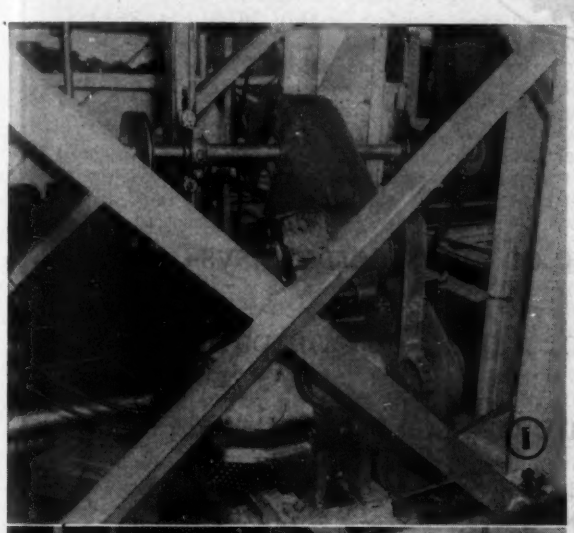
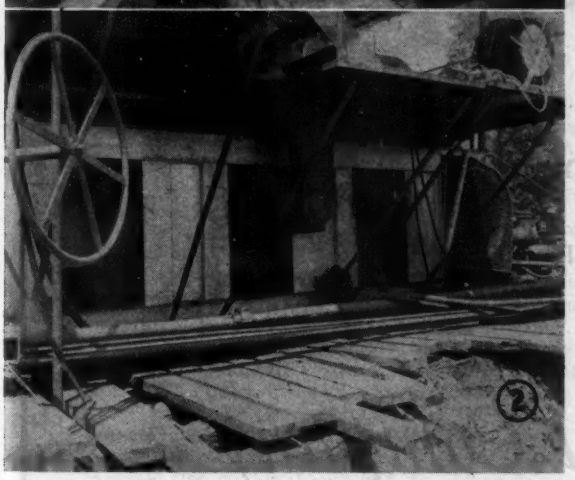
# OPERATING IDEAS

## Unitized Generator-Water Pump Installation

AN unusual hookup in which the generator and water pump on a drilling rig are driven by a common power take-off from the main engine transmission compound has been devised by a contractor operating in the Brookhaven field, in Mississippi. The generator and pump are installed as a unit in and as an integral part of one of the two sections comprising the engine substructure. Between them, supported in bearing cases secured to two leg members of the substructure is a common power shaft (Picture 1) with a belt-pulley drive to each of them. The shaft extends to the outer side of the substructure and on the end a pulley is mounted with a V-belt





drive from the extended power take-off shaft from the overhead engine compound (Picture 2). The substructure unit is semi-enclosed with steel sheeting for weather protection for the generator and pump and serves also as a dog house for storage of miscellaneous small parts and tools.

## Air Controls for Power Pump Clutches

ON most power rigs, clutches engaging the mud pumps are manually operated by control levers at the pumps. This necessitates that some member of the crew make

a trip to the pump whenever it is to be placed in operation or shut down. To avoid this, the crew on one power rig has rigged up pneumatic cylinders at each pump clutch and linked their pistons by lever arms to the respective clutch operating levers. The cylinders and, in turn, the clutches, are operated by means of small air control valves located at the driller's position (see accompanying picture).

## Well Control Valve

WHEN high-pressure gas-condensate wells must be controlled, provision of some means for shutting in the well without having to be at the christmas tree is desirable from a safety viewpoint. One operator equips the main valve with an extended control, a joint of 2½-in. pipe being used to station the operator more than 30 ft. from the well-head. At the main gate a universal joint is bolted to the handwheel, and the pipe welded to the shank of the joint. At the farther or outer end a half flange is welded to the pipe, to which are welded four spokes of sucker rod, each some 30 in. in length. Between adjacent spokes thus formed are welded braces to form a square, yet leave the outer 8 in. of each spoke available for handle. The pipe is carried in a socket formed by notching the 4-in. pipe support, and by passing a bolt through matching holes above the extension handle so that the assembly cannot be accidentally lifted from the support. The supporting unit is mounted on concrete, for maximum stability and safety.

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# MODERN Rotary DRILLING

## Deeper Drilling Resulting in Use of Heavier-Duty Wire Lines

USE of 1¼-in. rotary drilling lines for deep drilling has been practiced in California and the Mid-Continent for a considerable period of time. It has been, however, within the last 6 or 7 years that the trend has become quite general. The reason apparently has been not only the question of the increased breaking strength, because deep wells have been satisfactorily drilled with 1⅛-in. lines, but also a desire to obtain better balance between the tensile strength and resistance to abrasion and distortion. Preformed ropes and hemp centers appear to be favored.

As drilling becomes progressively deeper, ropes of diameters larger than 1¼ in. will be needed. Some experimental work is now being done with 1⅜-in. ropes. One manufacturer made 1⅜-in. experimental ropes which now are in use in California. One major operator has three ropes of this size in use in the Gulf Coast. Study of the performance of this is included in the general investigation and research on wire ropes, previously mentioned. No special problems have resulted so far from use of these ropes and there is no reason to believe that ropes of this, or larger, diameter cannot be used satisfactorily.

Opinion is prevalent that for drilling in the range of 15,000 to 20,000 ft., ropes with 1½-in. diameter will be needed. Use of rope of this diameter brings out the question of the size of the sheaves needed and of the rope flexibility. Possible use of 6 x 25 or 6 x 31 rope construction is considered.

### Length of Rope

Trend toward use of lines with length greater than that actually needed for stringing of the rig, started about 10 or 11 years ago. The purpose was to have available extra rope which could be pulled through, changing the main points of wear of the line with the resulting better utilization of the length of the line. With the increasing loads accelerating the rate of wear, the total length of the rope used continued to increase. Practical limitation of this trend was found recently in West Texas where a number of rigs were equipped with lines from 5,000 to 6,000 ft. long. It has been found that lines of this length are too bulky and affect unfavorably the efficiency of moving. When the rig is to be moved, the line has to be backed off the drum onto the original wooden reel and moved as a separate item. The reel may be found to be damaged to the point where it can not be used, and the line also may suffer damage during these operations. From the practical point of view therefore, the capacity of the draw-works drum represents a limitation for efficient length of line: In drilling, the line is moved through the system in the usual manner; in moving, the line is wound on the drum and moved with the draw works.

### Anchorage and Storage

Use of long lines presents the problems of dead-line anchorage and of storage of the extra length of the line. Since the line is being pulled through the hoisting system, the part of the line which was, under the old arrangement, the "dead end" of the line, becomes eventually a working part of the line. Thus all the precautions in regard to bending of the line, which are needed to protect the line from damage, also must be taken at the point of anchorage. On rigs equipped with auxiliary draw works, storage of the extra length of line does not represent a problem. On all other rigs, however, means must be provided for protective storage and easy spooling off of the extra line during pulling-through operation. A number of devices have been developed to serve these two purposes.

The first of such devices appeared around 1936 and is still being used. It consists of a frame and a snubbing wheel, and a clamp placed on a plate sliding on the frame. The line from the crown block is snubbed two or three times around the drum, is tightened in the clamp, which is locked in position, and is brought out to a special portable storage reel placed on the ground. The load is transferred from the snubbing drum through a clevis and sling to the sill of the rig. No load is placed on the frame. There is no great strain in the clamp, since the load is held primarily by the snubbing drum. In order to pull the line through, the blocks are laid down on the floor, or the dead line is held with the cat line, the clamp is loosened, desired amount of rope pulled from the storage reel, the line is reclamped, and the excess line is spooled on the draw-works drum.

Similar devices are on the market or have been developed by different operators for their own use. They differ in details of construction but they employ the three fundamental principles needed for accomplishing these desired purposes: (1) Use of snubbing action to reduce the strain in the clamp, (2) sufficiently large diameter of the drum to prevent excessive bending of the line, and (3) use of one long form-fitting clamp to prevent crushing of the line and to speed up the operation of pulling the line through.

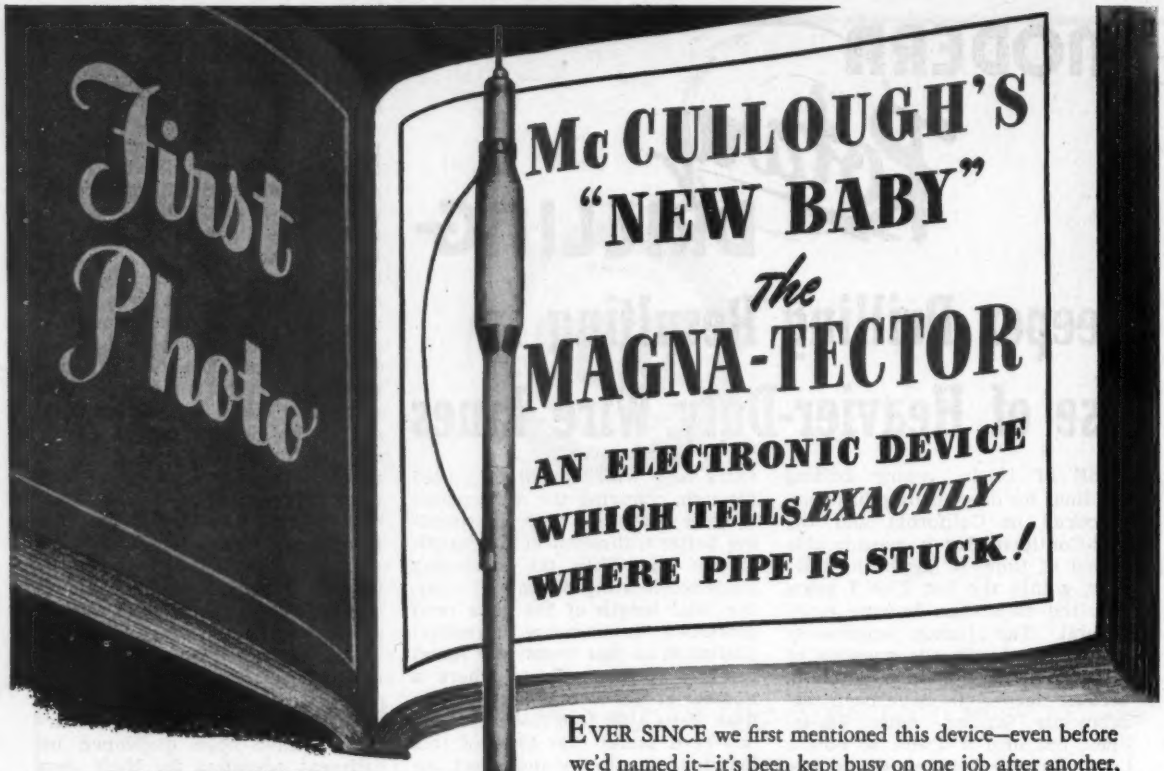
Sheaves with diameter of 60 to 72 in. may be needed in the future for large-size ropes. This would require radical changes in the design of derricks (Installment No. 8). Blocks with sheaves 48 and 50 in. in diameter are available.

Trend toward use of wider draw-works drum to reduce the number of layers of rope on the drum, and the practical limitations of this trend have been mentioned (Installment No. 15).

### Coring Lines

During the last year increased demands have been noted for preformed, galvanized coring lines. The characteristics of preformed lines are well suited for this kind of service. Galvanizing protects the line from the effects of atmospheric conditions during the long periods the line remains idle. This is of particular importance in areas of high humidity.

No. 29 in a series by Joseph Zaba, petroleum engineer, Houston

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Essentially, the Magna-Tector consists of two electromagnets connected by a telescopic joint containing an electronic measuring device. Run in the well on conductor cable and energized from the surface, the magnets cling to the pipe wall. A strain is then put on the pipe; free pipe registers by stretch, stuck pipe by lack of stretch. A few tests quickly locate the exact point at which pipe is stuck, often within *one foot*, because the electronic instrument is so sensitive that it will record stretch as slight as a few thousandths of an inch per hundred feet . . . see the case histories on the left.

**Magna-Tector users find *four* distinct savings in its use.**
**1. *Saves rig time.* 2. *Saves cutting,* because one cut is sufficient.**
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**4. *Saves footage* on re-drill jobs.**

### CASE HISTORIES

*Chosen not because they are exceptional, but because each was witnessed by a large number of engineers and superintendents.*

**6⅝" 26# casing, calculated to be free at 1500 feet, hole full of 79# mud. Magna-Tector indicated lowest free point at 1933 feet. Cut made at this point; pipe came free, saving 400 feet of pipe, and 400 feet of hole on the re-drill.**

**6⅝" 28# casing. Magna-Tector showed pipe stuck at 4,365 feet, free at 4,360 feet. Cut made at 4,360 feet; pipe came free.**

**6⅝" casing. Magna-Tector showed pipe stuck at 6,195 feet, free at 6,194 feet. As a check, cut was made a few feet below: pipe could not be pulled free. Second cut made at 6,190 feet (to miss a collar); pipe came free.**

**On November 6, 1946, the Magna-Tector was employed to test a string of 3½" drill-pipe. Found to be free at 10,680 feet, the pipe was cut off and readily removed from that point.**

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ENGINEERING *fundamentals*

# Test Data on Oil-Field Steels

FEW oil-field supervisors are charged with the responsibility of the selection of steels, but many have to make decisions as to how they shall be used. Quite often a choice of tubular goods must be made, but the pipe manufacturers have published handbooks, tables, and other data in forms so convenient to use that the selection of the proper pipe has become a simple matter. In general, for any steel product, it may be assumed safely that the manufacturer has made a thorough study of the possible conditions of service to which his product will be subjected, and has chosen his steel carefully.

However, in spite of the general excellence of oil-field steel products, they sometimes fail—often with serious consequences. Sometimes the failures are caused by lack of understanding by the operator of the nature of steel. For instance, broken shafts on draw works or pulling machines may be caused by changes in the strength of the steel brought about by heating the shaft with a torch to build up a keyway, or to weld a sprocket in place. Many eye and face injuries have been caused by a worker using a hard, brittle rig-builder's hand axe for a job more adaptable to a ball-pein hammer. The hammering of couplings causes premature sucker-rod failures.

The reasons for other types of steel failures may not be as apparent as in the examples mentioned above, and often it is desirable to have certain physical tests made on the material that failed in order to establish the reason for failure and to prevent recurrences. The following discussion of steel and some of the more important tests made on it, together with a few definitions and classifications, is offered with the hope that it may be of some assistance to production men in the interpretation of test reports and other data and specifications to which they occasionally refer.

Steel is an alloy of iron and carbon, and possibly other alloying elements and/or impurities, in which the proportion of carbon does not exceed 1.7 per cent. Low-carbon or mild steel has less than 0.25 per cent carbon, medium steel has from about 0.25 to 0.60 per cent carbon, and high-carbon or hard steel has from 0.60 to 1.7 per cent carbon.

### S.A.E. Classifying System

For oil-field use, other than for tubular goods, the Society of Automotive Engineers' system of classifying steels is commonly used. In this system, a numerical index is used to identify the composition of the steel. The first digit of the S.A.E. number indicates the type of steel; e.g., 1 means a carbon steel, 2 a nickel steel, 3 a nickel chromium steel, etc. The second digit generally indicates the approximate percentage of the predominant alloying metal, and the last two or three digits show the approximate average carbon content in hundredths of 1 per cent.

**TABLE 1—S.A.E. STANDARD STEELS**

| Type of steel— | Numerals (and digits) |
|---|---|
| Carbon steels | 1xxx |
| Plain carbon | 10xx |
| Free cutting (screw stock) | 11xx |
| Manganese steels | 13xx |
| Nickel steels | 2xxx |
| 3.50% nickel | 23xx |
| 5.00% nickel | 25xx |
| Nickel chromium steels | 3xxx |
| 1.25% nickel, 0.60% chromium | 31xx |
| 1.75% nickel, 1.00% chromium | 32xx |
| 3.50% nickel, 1.50% chromium | 33xx |
| Corrosion and heat-resisting steels | 30xxx |
| Molybdenum steels | 4xxx |
| Carbon molybdenum | 40xx |
| Chromium molybdenum | 41xx |
| Chromium nickel molybdenum | 43xx |
| Nickel molybdenum; 1.75% nickel | 46xx |
| Nickel molybdenum; 3.50% nickel | 48xx |
| Chromium steels | 5xxx |
| Low chromium | 51xx |
| Medium chromium | 52xxx |
| Corrosion and heat resisting | 512xx to 517xx |
| Chromium vanadium steels | 6xxx |
| 1% Chromium | 61xx |
| Tungsten steels | 72xx |
| Tool steels | 713xx and 716xx |
| Silicon manganese steels | 9xxx |
| 2% Silicon | 92xx |

Thus, 3130 indicates a nickel-chromium steel with approximately 1 per cent nickel, and 0.30 per cent carbon. Table 1 gives the key to the various types of S.A.E. steels. Of course, the numbers themselves afford only an approximate index to the composition of the steel. Other S.A.E. specifications give the proportions of each element forming the steel to which that number has been assigned. It should be kept in mind always that the properties of any given steel may vary within a wide range depending upon the heat treatment and working to which it has been subjected.

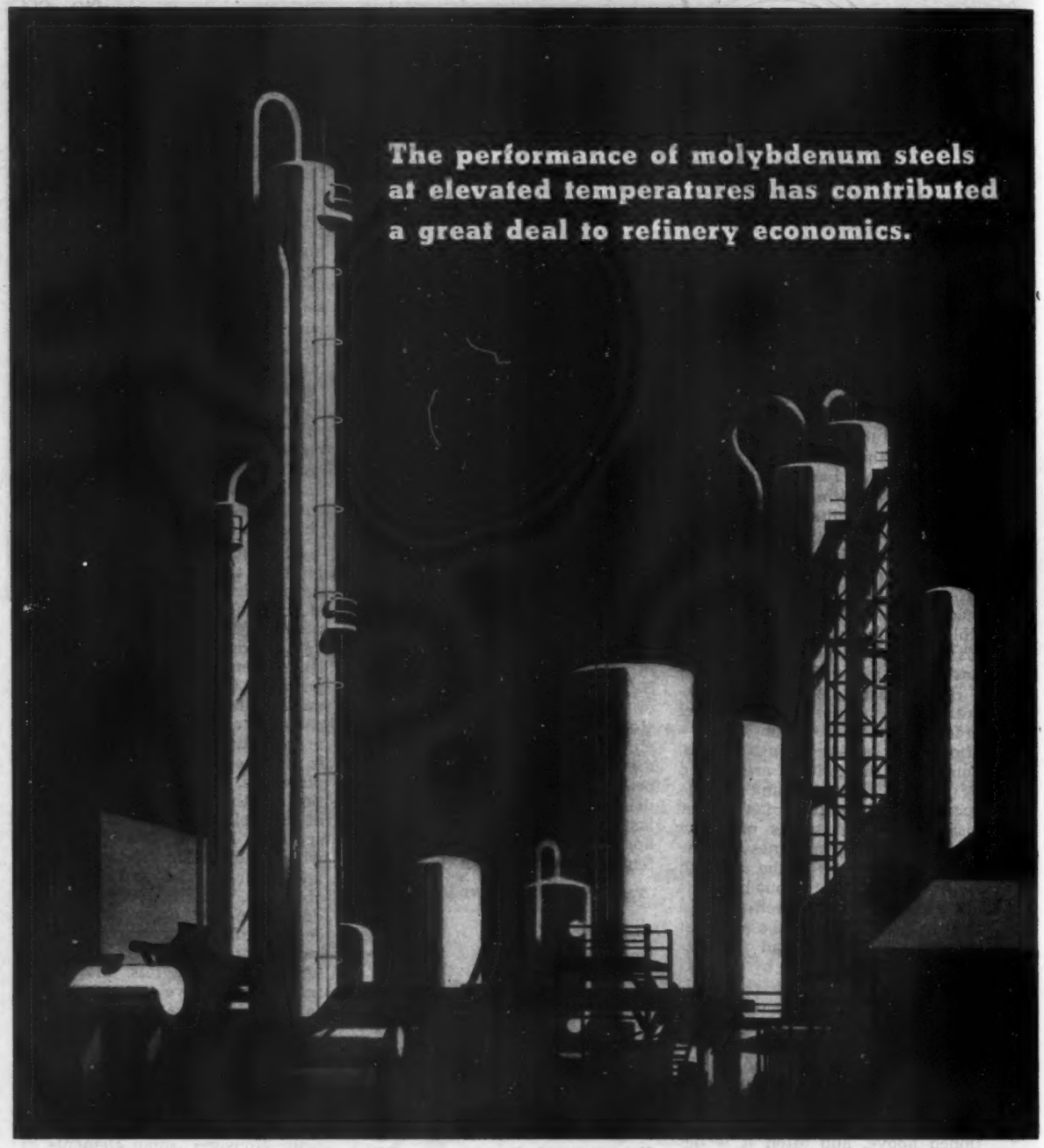
Since American Petroleum Institute pipe specifications are quoted in most pipe handbooks, and published in full in A.P.I. Standards 5-A and 5-L, they will not be discussed here except to mention one or two special applications of physical tests to A.P.I. standards.

Although both chemical and physical tests are made on steel, the physical tests usually are considered to be the more important, because users generally place more value upon what the material will stand than they do upon its composition. Chemical tests may be made either by the conventional chemical analysis or by use of the arc spectrograph. The spark test is very useful in providing a simple, rapid, approximate determination of the chemical composition of a steel. To make this test, a specimen is held against an emery wheel and the size, shape, pattern, and color of the spark train is observed. A skilled observer can determine the approximate percentage of carbon and other alloying elements by simple observation, while a person less thoroughly trained may have to compare the sparks with those of specimens of known composition.

Since chemical tests are limited to determining the proportion of each element in the sample, they are not as liable to misinterpretation as are some of the physical tests. However, some elements or combinations of elements may alter the properties of steel even though the quantities appear insignificant. For instance, only 0.05 per cent vanadium in almost any alloy increases the range of leeway in heating so that danger of brittleness from too much heat is minimized.* Unless the person receiving a test report is thoroughly familiar with metallurgy and its terms, he should insist that an interpretation and discussion of results accompany the report.

*Jas. P. Gill, Alloy Steels, Modern Steels, - A.S.M.

**Series prepared by H. N. Lyle, district engineer, Seaboard Oil Co. of Delaware, Dallas**

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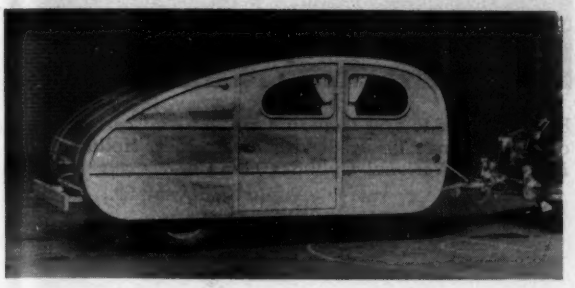
# OIL AND GAS EQUIPMENT Digest

IT'S NEW CHECK IT

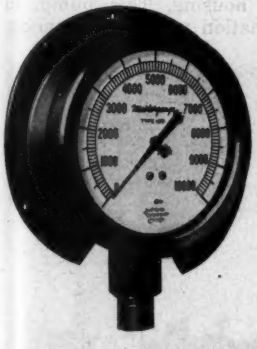
*by John M. Spears*

**(1) CABIN CAR TRAILER** features new station-wagon style with complete facilities and roominess for inside living or instrument-equipment adaptation without bulk and weight. Unit is equipped with built-in storage and



kitchen cabinets, wall mirror, double-bed divan, curtains, interior and exterior lights, 6 by 16 tires, collapsible parking stanchion, and ball-type hitch. Compact streamlined design provides inside roominess with complete cooking and sleeping facilities. Trailer may be converted easily into portable lab, geophysical-instrument house, or equipment bin. *Fleet Manufacturing, Inc.*

IT'S NEW CHECK IT



**(2) NEW PRESSURE GAGE** for corrosion service is used with the following materials: Acetic acid (nonaerated); alcohol (ethyl, methyl, prophyl); sodium acid sulfate; sodium chloride; oxalic acid (cold); carbon tetrachloride; milk of lime; boric acid; sugar solutions; tannic acid; citric acid; sulfuric acid (cold); alum solutions; and hydrogen sulfide. Gage features a lathe-turned beryllium-copper bourbon tube, with beryllium-copper locktite cones screwed at the tip and socket. It has a special bronzed-bushed movement with bronze pinion and arbor. Equipped with recalibrator to correct the gage in case it is knocked out of adjustment. *Jas. P. Marsh Corp.*

IT'S NEW CHECK IT

**(3) NEW HYSTAWAY** is a combination drag line, clamshell, and crane that retains the utility of a track-type tractor equipped with a bulldozer. In laying pipe lines, unit drag lines the ditch, operates as a crane to lower pipe, and then completes operation by backfilling with the bucket or bulldozer. Utility use of bulldozer is possible with the complete Hystaway installed. Full-production bulldozer use is ready in 1 hour with removal of all but one transmission. Unit can be attached in 2 hours or removed in 1, after the initial installation. Full-track oscillation is available on a standard tractor, and track rigidity can be secured by turning a crank at the mast-head. Mounted unit can be transported on flat-bed trailer with vertical clearance of less than the tractor gas tank. The unmounted unit can be transported in dump trucks. *Hyster Co.*

IT'S NEW CHECK IT

**(4) MOBILE ACIDIZING UNIT** enables treatments to be make quickly and safely. Trailer is pulled by an

**The Oil and Gas Equipment Digest presents a review of what is new in equipment and trade literature . . . makes it possible for readers to obtain full information on every subject by use of convenient "Check It—Mail It" service card. This periodic feature of The Oil and Gas Journal will include all that is new in equipment . . . at a time when new products are being introduced, and existing products improved.**

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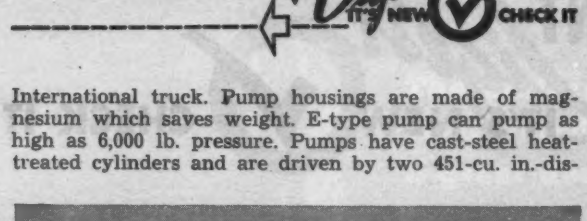
International truck. Pump housings are made of magnesium which saves weight. E-type pump can pump as high as 6,000 lb. pressure. Pumps have cast-steel heat-treated cylinders and are driven by two 451-cu. in.-displacement, 130-hp. International motors with compound chain drive. On end of unit is mounted a 1,000-gal. acid tank made of corrosion-resistant Yoloy steel. Exhaust from the engines are of the safety type. Unit is completely equipped with $CO_2$ fire extinguishers. First-aid kit carries all standard equipment including fire blankets. Unit is completely lighted for safe night operation and all moving parts are protected by steel guards. *Dowell Incorporated.*



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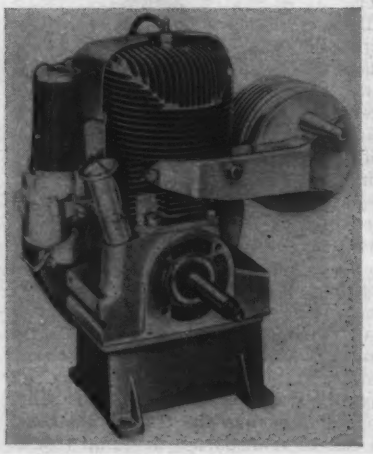


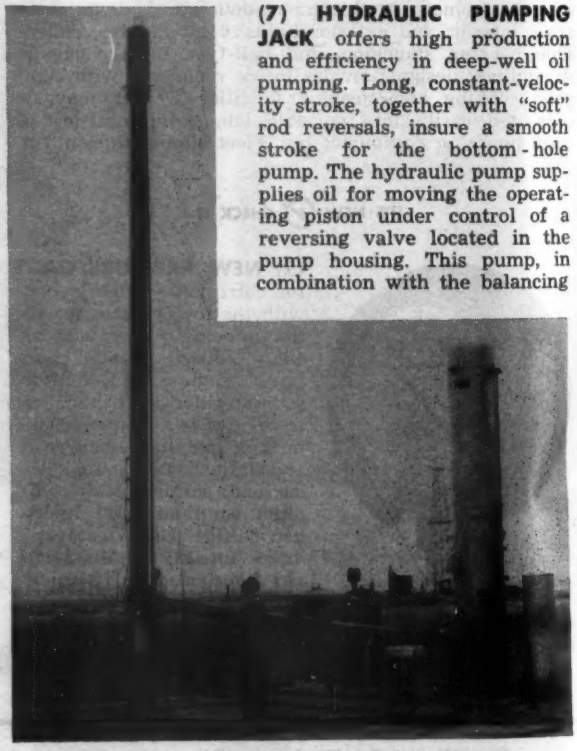
**(5) LIGHT-WEIGHT GASOLINE ENGINES** are the two-cycle type, available in four models which range from 2½ to 4 hp. Light weight is derived from use of aluminum-alloy die castings. A "reverse-flow" scavenging system obtains correct turbulence and distribution of incoming fuel charges by means of vaned intake ports, which aids starting and idling characteristics. Pressure oil system eliminates the need for mixing oil with gasoline. A separate injector meters the correct amount of oil for lubrication to the engine bearings.. Units are air cooled. *McCulloch Motors Corp.*

IT'S NEW CHECK IT

**(6) SUREWELD PORTABLE WELDER** features light weight—315 lb.—and compact construction. It fits easily into the back of a jeep, station wagon, or even the trunk compartment of cars, and can be lifted by two men. Light weight is achieved through use of aluminum housing and aluminum alloys in engine parts. Generator and engine are directly connected. Generator is a four-pole, self-excited type with interpoles. Welder is rated at 150 amp. at 30 volts on 50 per cent duty cycle. It has a four-cycle, two-cylinder, opposed-design motor. An air-cooled, turbine-type fan cools unit. Opposed-cylinder design simplifies distribution of the cooling air and results in smoother running balance and freedom from vibration.

Electrodes up to and including 5/32-in. and certain types of 3/16-in. may be used with the welder. *Hollup Corp., Division of National Cylinder Gas Co.*

IT'S NEW CHECK IT



**(7) HYDRAULIC PUMPING JACK** offers high production and efficiency in deep-well oil pumping. Long, constant-velocity stroke, together with "soft" rod reversals, insure a smooth stroke for the bottom-hole pump. The hydraulic pump supplies oil for moving the operating piston under control of a reversing valve located in the pump housing. This pump, in combination with the balancing tank, delivers oil to the hydraulic cylinder during the upstroke and takes it away during downstroke. Hydraulic cylinder consists of a long polished tube with operating piston and polished rod. It is mounted on the casing head and the polished rod is connected to the string of sucker rods in the well. Balancing tank is maintained under controlled hydropneumatic pressure to provide

nearly constant input power to the jack during the complete operating cycle. *Pelton Water Wheel Co., Inc.*

IT'S NEW CHECK IT

**(8) PROPELLING AND STEERING EQUIPMENT** powers lighters, barges, and other craft used in offshore drilling and producing operations. Models range from 20 to 30 hp., gas or diesel powered. Units can readily fit into any engine standardization program. All models are equipped with 360° propeller-thrust steering control which allows operator to steer by the thrust of the propeller itself. This instant control with full power in any direction eliminates the conventional rudder. Also has 360° elevating mechanism which allows operator to elevate entire submerged assembly, out and up, to a position where every part is within easy reach for service or repair. *Murray & Tregurtha, Inc.*

IT'S NEW CHECK IT

**(9) ALL-PURPOSE IMPACT TOOL** will apply and remove nuts; drill, ream, tap, drive, and remove screws and studs; extract broken cap screws and studs; run wire brushes; do hole-saw work; drill brick and masonry; and drive wood augers. It weighs only 6½ lb., has an over-all length of 10½-in., a free speed of 2,000

r.p.m. and delivers 1,900 rotary impacts per minute under load. It is powered with a reversible, universal, electric motor (3 amp.) that operates on 110-volt, a.c.-d.c. current. Impact tool runs just as any conventional electric tool unit until the resistance to spindle rotation reaches a certain amount. Then a mechanism converts power of the motor into "rotary impacts" which exert a powerful turning effect. An advantage of the impact mechanism is that it permits the spindle to be stalled completely while the motor continues to run, thus eliminating motor burnouts caused by overloading. *Ingersoll-Rand Co.*

IT'S NEW CHECK IT

**(10) O. D. WINDMASTER** will protect the welding arc in any kind of weather. It is a shield that will let gangs work despite adverse wind activity, and eliminates costly shutdowns and delays on windy days. It will permit a weld with the quality characteristics of inside-building welding. Constructed of aluminum and rubber, it is lightweight and easily installed and moved. It consists of two half-circle identical parts, which may be used singly, as shown in illustration, or together. The chain and spring feature snugs the unit against the pipe. *General Manufacturing Co.*

IT'S NEW CHECK IT

**(11) RUBBER-COATED GLOVES** resist oil, grease, acid, and other harmful liquids and materials. Also resist rips and tears and will not snag when handling rough or sharp objects. Cuff may be turned back to prevent run back of fluids when hands are held upward. New pattern has wider thumb span and longer palm. Firm grip and hand comfort are assured with curved thumb and fingers. *Edmont Manufacturing Co.*

IT'S NEW CHECK IT

## TRADE LITERATURE

**(12) ROTARY MACHINE.** Sectional views, blueprints explosion photographs, and complete specifications of the SHS-20½ rotary machine are given in Bulletin No. 340. Photographs include shop views of the cutting of the spiral bevel-gear train of the machine. Twelve pages. *The National Supply Co.*

IT'S NEW CHECK IT

**(13) STEEL, IRON, AND BRONZE VALVES** are completely covered in new 248-page catalog. Profusely illustrated with outside and cross-sectional wash drawings of manufacturer's line. Designed to assist engineers, purchasing agents, production men and management in selecting right valve for right job. *The Ohio Injector Co.*

IT'S NEW ✓ CHECK IT

**(14) AEROTAN.** New pocket-size booklet describes chemical reagent designed to treat oil-well-drilling muds in order to procure better water-loss control, to improve mud-wall-cake characteristics, and to overcome the adverse effects of cement contamination. *American Cyanamid Co.*

IT'S NEW ✓ CHECK IT

**(15) THE HORTONSPHERE.** New eight-page booklet describes the reduction of evaporation losses from highly volatile liquid by storing them under pressure in Hortonspheres. Correct storage pressure required to prevent standing losses from volatile liquids can be read directly from a chart included in this booklet. Another chart determines the vapor pressure of the product to be stored at a given temperature. Gaging methods are described and photographs of three typical gaging units are shown. *Chicago Bridge & Iron Co.*

IT'S NEW ✓ CHECK IT

**(16) PETROLEUM PLANT DESIGNS.** Comprehensive 62-page, 4-color brochure offers to petroleum refiners and chemical manufacturers integrated services which extend from engineering surveys of existing facilities and economic studies to the initial operation of refinery process units and chemical manufacturing plants. Contains photographs, drawings, and 30 flow diagrams of refinery processes. *Lummus Co.*

IT'S NEW ✓ CHECK IT

**(17) NEW STEEL BUILDINGS.** New two-color broadside describes and illustrates structure for overseas service wherever permanent structural steel buildings are desirable. Simplicity of design makes for compact packing of individual parts for low transportation costs, and corresponding economics in shipments. *Beers Steel Building Corp.*

IT'S NEW ✓ CHECK IT

**(18) FIRE PROTECTION VALVE.** Valves, weight-operated with pendulum stop, for fire-protection service, are treated in new two-color folder. Features the closing type for emergency shutoff of the flow of inflammable liquids, or to concentrate water or steam in fire mains; and the opening valve for diversion of water to sprinkler deluge or water curtain systems, or to divert inflammable liquids to a point of safety. *Everlasting Valve Co.*

IT'S NEW ✓ CHECK IT

**(19) SILENT CHAIN DRIVES.** A 3/16-in. pitch silent chain is the subject of a new 16-page illustrated booklet devoted to "industry's biggest little chain drive" for fractional-horsepower drives. It is a quiet, compact, high-speed, flexible drive that can be used in a great variety of drive arrangements. Contains dimensions of sprocket wheels, horsepower ratings, and information on how to select a chain drive, including calculation of chain drive centers and length of chain required. *Link-Belt Co.*

IT'S NEW ✓ CHECK IT

**(20) RESISTANCE WELDING ELECTRODES.** New publication catalogs a comprehensive line of spot welder tips and holders, seam welder wheels, and other resistance welding accessories. Profusely illustrated with diagrams showing dimensions of tips and holders. Also contains table of properties of alloys. *Ampco Metal, Inc.*

IT'S NEW ✓ CHECK IT

**(21) CONSULTING CHEMISTS AND CHEMICAL ENGINEERS.** A 1947 edition of company brochure under the heading, "The Chemical Consultant and Your Business," follows an outline of many types of problems which the chemical consultant encounters. Indicates types of business enterprises which find continual or occasional use for the services of chemical consultants. Also deals with the various branches of service offered. *Foster D. Snell,, Inc.*

IT'S NEW ✓ CHECK IT

**(22) OIL-FIELD ELECTRIFICATION.** New 109-page application textbook covers electrical equipment and methods in the petroleum industry. Field photographs, charts and cut-away drawings illustrate this comprehensive material. Table of contents includes subjects entitled: well-drilling, oil-well pumping, power-distribution systems for oil-field pumping service, oil-pipe-line pumping, and miscellaneous electrical applications. A must for those interested in electrification. *General Electric Co.*

IT'S NEW ✓ CHECK IT

**(23) TRAVEL COMPARISON COSTS.** New 28-page, 2-color, steel-ring-bound brochure presents a comparison of what it costs in both time and dollars to get personnel to a destination and back in a car and manufacturer's light plane. Illustrated. *Cessna Aircraft Corp.*

IT'S NEW ✓ CHECK IT

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# NATURAL GAS

## Denver-Cheyenne Line Authorized by FPC

WASHINGTON. — Construction of the second project in a program of enlargement of natural-gas transmission facilities in the Rocky Mountain area has been approved by the Federal Power Commission.

The project is the $1,542,450 proposal of Colorado-Wyoming Gas Co. for a new line between Denver and Cheyenne, Wyo. The line will supplement an existing system which proved inadequate last winter to meet natural-gas demand. It will connect near Denver with the 240-mile, 20-in. line from Lakin, Kans., to Denver which is now under construction by Colorado Interstate Gas Co. following approval by the FPC.

Colorado-Wyoming will build about a mile of 16-in. from a connection with Colorado Interstate's new line, a 1,200-hp. compressor station at the northern end of the interconnection, and about 88½ mile of 8-in. and 11½ miles of 16-in. extending to the city limits of Cheyenne. The new line will be linked into Colorado-Wyoming's existing system near Brighton and Greeley, Colo., and at Cheyenne. The gas will be sold along the route and also delivered to Cheyenne Light, Fuel & Power Co. for resale in the Cheyenne area.

The company told FPC it has all the necessary 16-in. but that the 8-in. will not be available until the last quarter of this year. To meet demand during the winter season, Colorado-Wyoming plans to interconnect the 11½ miles of 16-in. on the northern end of the new line with its existing facilities and use this section for storage to meet peak load periods. *(The Oil and Gas Journal, June 21, page 135).*

## Gas-Industry Expansion Revealed in FPC Reports

WASHINGTON. — Operating revenues of natural-gas companies reporting to the Federal Power Commission amounted to $60,698,323 in April 1947, an increase of 29.6 per cent over the $46,828,547 reported for the same month a year ago.

Gas-utility operating income increased to $14,183,891, a gain of $4,664,589 or 49 per cent. Gross income, including gas-utility operating income, and nonoperating income amounted to $17,755,901, an increase of 40.8 per cent over April of last year. Net income for the month was $14,849,216, an increase of 58.2 per cent over $9,386,130 reported for April 1946.

Gas sales to ultimate consumers in April 1947 were up 23.2 per cent over those in April 1946. Revenues from such sales increased 32.5 per cent and amounted to $32,005,563. Sales to residential consumers increased 59.3 per cent and to commercial and industrial consumers 65.2 per cent and 13.4 per cent, respectively. Revenues from these three consumer groups were: residential, $16,750,494; commercial, $3,547,072; and industrial $11,034,546, up 47.7 per cent, 58.9 per cent, and 12.2 per cent respectively over April 1946.

For the 12 months ending April 30, 1947, gas operating revenues aggregated $623,240,374, an increase of 13 per cent over the total of $551,764,406 reported for the 12 months ending April 30, 1946. Net income for the period amounted to $132,930,040 compared to $111,001,368 for the 12 months ending April 30, 1946, an increase of 19.8 per cent.

The book cost of gas plant of the reporting companies aggregated $2,010,447,915 on April 30, 1947, compared to $1,918,995,435 reported 1 year earlier.

## Michigan Consolidated Proposes Storage Plan

WASHINGTON.—Michigan Consolidated Gas Co. has asked the Federal Power Commission to authorize construction and operation of pipeline and storage facilities in Michigan for storage of natural gas obtained from Panhandle Eastern Pipe Line Co. or to determine that the FPC does not have jurisdiction over the facilities involved.

The facilities would be used to store in Austin field for subsequent withdrawal and distribution in the Detroit district, natural gas obtained from Panhandle Eastern at the Detroit city gate. The company said it expected to begin storage of gas obtained from Panhandle not later than April 1, 1948.

If the commission finds that it has jurisdiction, Michigan Consolidated requested authority for:

1. Operation, pending completion of the Michigan-Wisconsin Pipe Line Co.'s project, of a 26-in. line between Austin field and Detroit, a metering station at Evergreen, and a compressor station at Austin field, which have been proposed for construction by Field Pipe Line Co. in a pending FPC application.

2. Construction and operation of a proposed 26-in. ppie line connection to extend some 14½ miles from the east end of the Austin-Detroit line at Evergreen to Melvindale, where natural gas is delivered to Michigan Consolidated by Panhandle Eastern.

3. Continued operation, pending completion of the Michigan-Wisconsin project of the Austin Storage field.

Cost of the facilities to be constructed was estimated at $1,014,000. Such facilities are ultimately to be acquired by Michigan Wisconsin Pipe Line Co.

# Natural Gasoline

## Sixteen Producers Join in New Louisiana Plant

Sixteen Louisiana oil producers have joined in a modern project to prevent waste of natural gas in Delhi, West Delhi, and Big Creek oil fields, according to an announcement by James E. Pew, manager of the natural gas and natural gasoline division of Sun Oil Co. in Philadelphia.

In one of the first cooperative natural-gasoline extraction ventures in the industry, the operators have become part owners of a plant being constructed under the supervision of Sun Oil. The plant will process approximately 17,000,000 cu. ft. per day of casing-head gas to reduce by this amount the volume of gas flared in Louisiana oil fields.

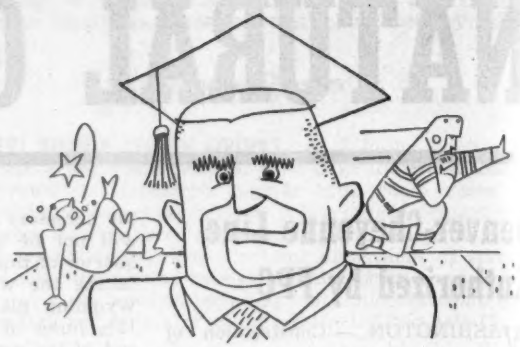
Until now the amount of gas in these fields was insufficient to justify costs involved in collecting and processing, which require an extensive pipe-line gathering system and the building of a new plant.

The new plant, under construction on a 40-acre site in Richland Parish, will extract 70,000 gal. per day of liquid hydrocarbons, including propane, butane, and natural gasoline. Remaining dry gas will be piped to a connection with a natural-gas pipe line company and sold as fuel.

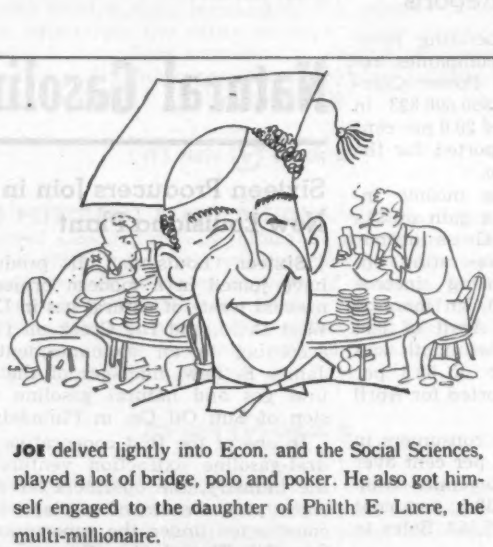
Sun and C. H. Murphy, Jr, jointly own approximately 64 per cent of the producing acreage. Sun has been designated as operator and will have charge of the construction, operation and maintenance of the plant. Petroleum Engineering Co., Houston, will build the installation.

# Most Likely to Succeed

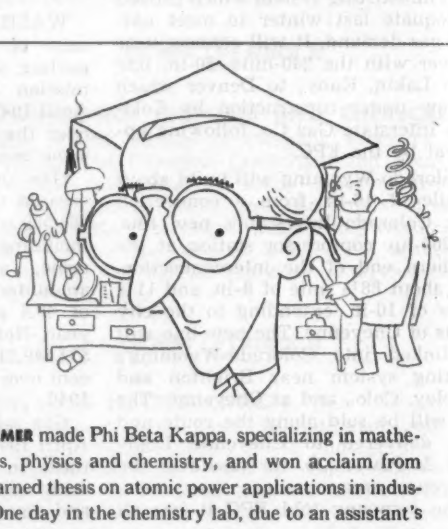
**MOST LIKELY TO SUCCEED** is a title usually accorded to some member of a graduating class. At Joakon "U" they parlayed on Moe, Joe and Herkimer.



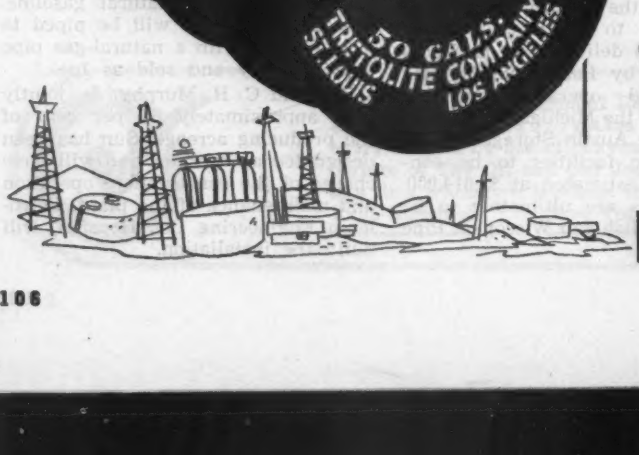
**MOE** majored in Phys. Ed. Played fullback on football team, center on the basketball team, and pitched for the ball club. Moe has already signed big league contracts in football and baseball, has a movie contract and some offers to play basketball.



**JOE** delved lightly into Econ. and the Social Sciences, played a lot of bridge, polo and poker. He also got himself engaged to the daughter of Philth E. Lucre, the multi-millionaire.



**HERKIMER** made Phi Beta Kappa, specializing in mathematics, physics and chemistry, and won acclaim from his learned thesis on atomic power applications in industry. One day in the chemistry lab, due to an assistant's error, he hit on a beauty cream formula supposedly worth millions.

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DEHYDRATING DESALTING

TR 47-G

# REFINING

## New Unit at Coffeyville To Go on Stream August 1

The new vacuum distillation unit at the Coffeyville, Kans., refinery of Cooperative Refinery Association will be placed in operation August 1, according to Louis C. Brown, chief refinery engineer.

Designed and constructed by Process Engineers, Inc., Dallas, the unit will handle 4,000 bbl. per stream day of reduced crude oil and operate under a reduced pressure of 10 mm. absolute.

Products from the unit will be a heavy gas oil overhead, three lube-base distillate side cuts, and asphalt bottoms. Construction required 8 months; cost was approximately $575,000.

The catalyst in the refinery's Universal Oil Products polymerization unit was recently replaced after having produced 140 gal. per lb. of 10-lb. polymer gasoline. Brown pointed out this is an unusually long catalyst life for the chamber-type process, the average being more in the range of 70-80 gal. per pound.

## U. S. Rubber To Take Over Borger Plant

Operation of the Government's 45,000-ton synthetic rubber plant at Borger, Tex., will be taken over by the U. S. Rubber Co., it has been announced. Simultaneously, U. S. Rubber will discontinue operation of the plant at Los Angeles.

The company also announced that it would gradually reduce operations at its Institute, W. Va., plant in accordance with the Government's policy of curtailing synthetic production as more natural rubber becomes available. The production of synthetic-rubber latex will continue at the company's Naugatuck, Conn., plant.

## Further Expansion Planned In Shell Ammonia Output

Plans for another step in the expansion of synthetic ammonia production by the Shell Chemical Corp. have been announced by J. Oostermeyer, president.

The new expansion program, designed for the company's plant at Shell Point, near Pittsburg, Calif., is directed toward an increase in capacity of about 50 per cent over present production. Equipment for the increased capacity is scheduled to be in service in about a year.

The first step in the postwar expansion of this plant, already the largest ammonia plant in the West, was completed only recently, Oostermeyer said. The plant for added ammonia-producing facilities is in keeping with the continuing need for ammonia and ammonia products for agricultural and industrial requirements.

## Sun Changing Catalyst At Toledo Refinery

Catalytic Construction Co., Philadelphia, whose personnel previously supervised reconstruction and maintenance of Sun Oil Co.'s refineries, will take over the catalyst change at Sun's 12-case Houdry fixed-bed catalytic cracking unit in Toledo, Ohio.

Workmen will begin operations this week on the 12-case unit, which is equipped with the new tube design, and it is expected that the complete catalyst change will be accomplished within 3 weeks. Six cases will be worked on at one time, while the other six remain on stream.

## Government Lifts Some Export Controls on Wax

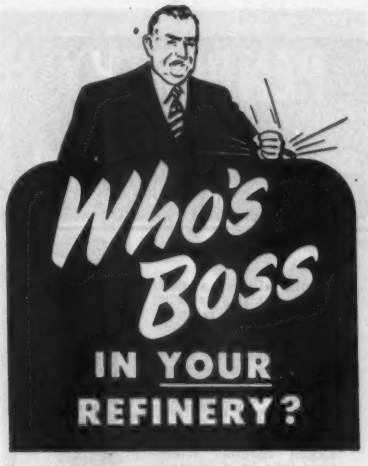
Export controls on unrefined and semirefined paraffin waxes, slop waxes, and mineral waxes, except ceresin, hardening, and microcrystalline, have been removed by the Office of International Trade of the U. S. Department of Commerce.

These waxes are either specialty waxes for which there is no significant export demand or the poorest grades of paraffin wax unsuitable for food preservation domestically, OIT said. Refined paraffin wax, candles, and the three mineral waxes—ceresin, hardening, and microcrystalline—will remain under export control.

## Du Pont Leases Tulsa Fuels Laboratory Site

E. I. duPont de Nemours & Co., Wilmington, Del., has taken a lease on a two-story warehouse building in Tulsa for use as a petroleum-fuels laboratory.

A 3-year lease has been obtained on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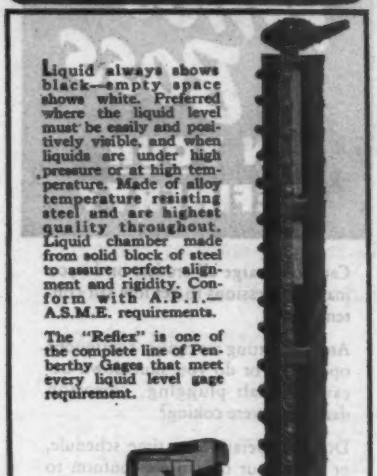

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the structure which contains 10,000 sq. ft. of space. The laboratory is expected to concentrate on development of fuels and will collaborate with oil refineries in the area.

## Texaco to Supply 30 Per Cent Navy Lube Oil

The U. S. Navy has awarded a $6,325,000 contract to The Texas Co. covering approximately 30 per cent of the Navy's total lubricating-oil requirements for the fiscal year 1947-1948, it has been announced by R. L. Saunders, Texaco vice president in charge of domestic sales. The new contract is one of the largest lubricating oil contracts ever awarded by the Navy in peace time.

Saunders said the contract covers 22 grades of oils, totaling approximately 8,000,000 gal. This is the twelfth consecutive year that Texaco has been awarded a navy contract, he added.

## Demand for Lubricating Oils Continues to Gain

Exports of lubricating oils increased 1,534,000 bbl. during the first 4 months of 1947, compared with the same period of 1946, while domestic demand increased 1,039,000 bbl. during the same period, according to Bureau of Mines figures.

Exports of lubricating oils totaled 4,901,000 bbl. during the first 4 months of 1947, compared to 3,367,000 bbl. during the same period a year earlier. Domestic demand totaled 11,626,000 bbl. during the opening 4 months of this year against 10,587,000 bbl. in 1946.

Exports dropped from 1,294,000 bbl. in March to 1,283,000 bbl. in April, while domestic demand climbed from 2,929,000 bbl. in March to 3,066,000 bbl. in April.

## Union Pacific Orders Two More Diesel Units

Two 6,000-hp. diesel-electric locomotives, to cost $1,250,000 and to be delivered in February 1948, have been ordered by Union Pacific Railroad.

George F. Ashby, president, said the company now has orders placed for 143 diesel units, of which 31 are to be assigned to passenger service.

## Canadian Lube-Oil Sales Show 11 Per Cent Gain

According to a survey made by the Canadian Bureau of Statistics, sales of lubricating oils in Canada during 1946 amounted to 57,999,562 gal., an increase of 11 per cent over 1945.

Of the total, 36,116,871 gal. were for motor transport use; 397,108 gal. for aircraft; and 21,485,583 gal. for industrial and other uses. About 42 per cent of the total sales was made in Ontario, 18 per cent in Quebec, 23 per cent in the Prairie provinces, 7 per cent in the Maritimes, and 9 per cent in British Columbia.

## Employment in Refining Industry on Increase

Total employment in the refining industry increased 0.4 per cent during April, according to a report of the U. S. Bureau of Labor Statistics.

During March new employes figured 1.5 per cent of the total number of persons employed in the industry, while 1 per cent of the total employes were separated. During April, new employes figured 1.9 per cent of total employment, which no change noted in the number of separations.

## Safety Data Issued

The publication of Chemical Safety Data Sheet SD-12 on carbon disulfide, twelfth in a series of chemical-products safety manuals, has been announced by the Manufacturing Chemists' Association. The data sheet may be obtained at 20 cents per copy from the Manufacturing Chemists' Association, 608 Woodward Building, Washington 5.

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# PIPE LINES

## Centrifugal Compressor Permit Given T. G. & T.

WASHINGTON. — Tennessee Gas & Transmission Co. has been given authorization by the Federal Power Commission to construct and operate near Morehead, Ky., an experimental compressor station consisting of centrifugal-type compressors driven by induction electric motors.

The installation will consist of one unit of three 3,600-r.p.m. centrifugal compressors in series, with each centrifugal compressor driven by a squirrel-cage induction electric motor. The capacity of the station, the company said, would be approximately 350,000,000 cu. ft. a day and would require 5,500 hp. Cost is estimated at $477,000.

In its application, T. G. & T. said that by installation of the station, capacity on the north end of its system would be increased substantially and would make additional gas available in the Appalachian area during the coming winter. Completion of construction is expected by December 1. The company must file an application for a permanent certificate within 6 months after the compressor station is put into operation.

## Texas Eastern to Install Additional Compressors

WASHINGTON.—The Federal Power Commission has granted a request of Texas Eastern Transmission Corp. to modify a temporary certificate previously issued and permit installation of additional compressor facilities by January 1948 on the Big and Little Big Inch lines.

In its application Texas Eastern said that in view of the short-gas-supply situation existing in the Appalachian area, it has investigated the possibility of procuring materials and equipment necessary to install compressor stations in addition to those authorized, and as a result has determined that materials and equipment can be obtained to add an aggregate of 43,750 compressor horsepower which together with the 28,000 hp. already authorized would increase the capacity of the lines to 340,000,000 cu. ft. a day. Cost of the additional compressors would approximate $3,200,000.

The additional compressors would be installed at seven pumping stations on the lines. Centrifugal compressors would be used at six locations and reciprocating type compressors at the other.

## Permian Basin-Cushing Line Work to Start Soon

Construction is expected to start within the next 3 months on a 515-mile, 20 and 24-in. pipe line from Jal, N. M., to Cushing, Okla. The line is a joint operation of the Texas Pipe Line Co., Shell Pipe Line Co., Empire Pipe Line Co., and the pipe-line division, Sinclair Refining Co.

It is understood that surveys and right-of-way buying is under way, but that no construction contracts have been let. Delivery of pipe is scheduled to begin in September and the expected completion date is the third quarter of 1948.

Initial capacity will be 144,000 bbl. daily, with Texaco receiving 65,000 bbl.; Shell, 50,000 bbl.; Empire, 15,000 bbl., and Sinclair, 14,000 bbl. Pump stations will be installed at Jal, Wink, Midland, and Wichita Falls, Tex.

## Pipe-Line Use for Motor Fuel Shows Increase

Deliveries of motor fuel from pipe lines during the first 4 months of 1947 totaled 68,947,000 bbl., an increase of 5,867,000 bbl. from the total of 63,080,000 bbl. during the same period in 1946.

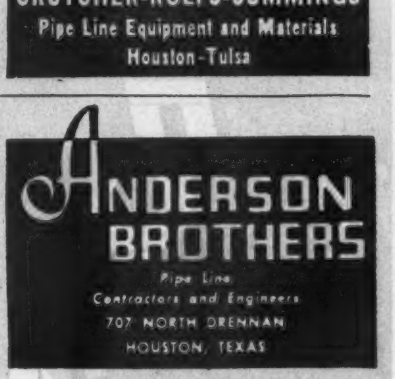
Motor fuel turned into pipe lines during the first 4 months of 1947 totaled 70,673,000 bbl., an increase of 8,734,000 bbl. compared with the total of 61,939,000 bbl. during the same period of the previous year.

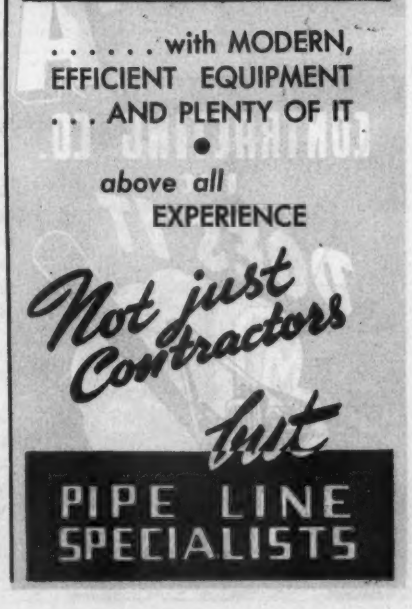
April deliveries totaled 18,906,000 bbl., compared with 19,060,000 in March, while fuel turned into lines totaled 18,954,000 bbl. in April, against 19,128,000 bbl. in March.

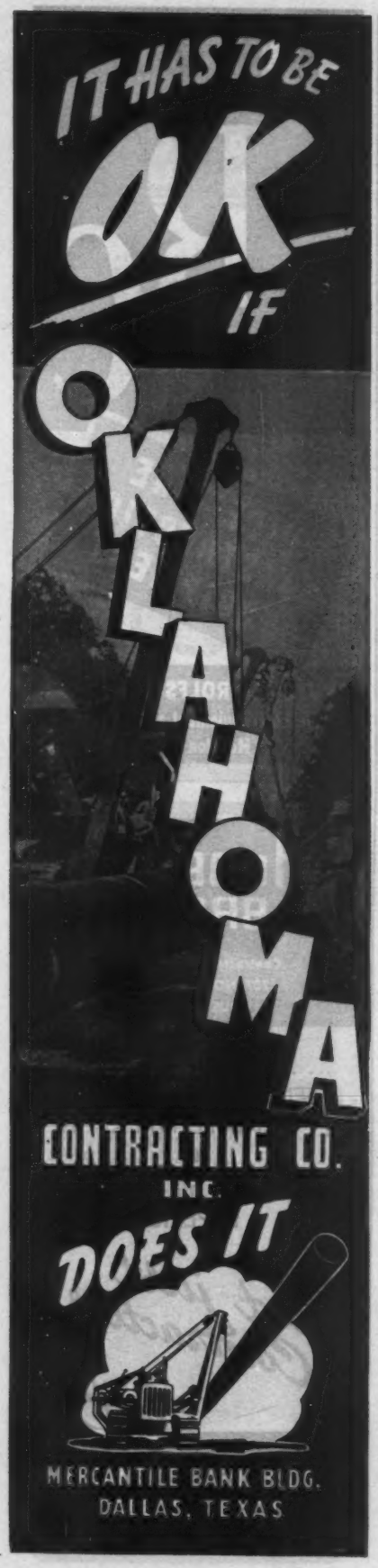
## Osceola, Iowa-Omaha Line Sold by Great Lakes

Sale of the 6-in. pipe in its 120-mile line between Osceola, Iowa, and Omaha, Neb., with removal scheduled to begin by July 20 and be completed within 45 days, has been announced by officials of the Great Lakes Pipe Line Co.

The company, which transports









gasoline and other refined petroleum products, has operated the line as a spur to its lines to Minneapolis. A new 8-in. line which runs directly from Kansas City to Omaha on the west side of the Missouri River has made the spur obsolete. The northern terminus of the new line is Grand Forks, N. D. The name of the purchaser of the Osceola-Omaha line was not announced by Great Lakes.

The first Great Lakes line between Osceola and Omaha was of 4-in. pipe and was laid in 1931. Because of the heavy demands of business at the Omaha terminal, the 4-in. pipe was replaced by a 6-in. line in 1937 and the original pipe sold by the company.

Officials said the pumping station at Corning, Iowa, which has not been operated for several years, but which has been well maintained, will be sold or dismantled.

Although Omaha is used as the address of the Great Lakes terminal, the property actually is mostly on the Iowa side of the state boundary, at Carter Lake. Many years age the Nebraska - Iowa boundary was affected by a change in the course of the Missouri River which left a small portion of Iowa on the west side of the stream. It is on this land that the terminal is located. One-third of one tank extends across the line into Nebraska, the remainder is on the Iowa side.

## Pipe Ready for Sun's Jameson Field Line

Pipe has been unloaded for Sun Oil Co.'s 6-in. crude-oil line from its Jameson field in northwestern Coke County, Texas. Scurlock Oil Co., Houston, is purchasing the entire output of the field, currently about 500 bbl. daily from five completed wells, and will truck the oil from Colorado City to Bronte, from where it will be shipped via Santa Fe to a refinery in Canada, it was said.

The new line will have a capacity of between 7,000 and 8,000 bbl. daily, and is scheduled for completion in September. Colorado City is approximately 25 miles north and slightly west of Jameson field.

## Shell Builds New Stations On Wood River-Chicago Line

Shell Oil Co., Inc., is breaking ground for five pump stations on the products line between Wood River, Ill., and Chicago. These will replace units originally installed for crude-oil service 22 years ago and later continued in products pipe-line service after conversion to products transportation in recent years.

The new stations will be located near the Illinois towns of Barnett,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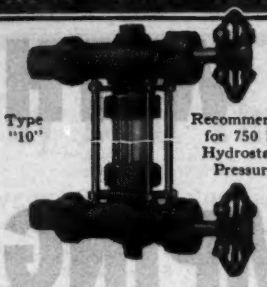


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Auburn, De Witt, Sibley, and Bradley. Each station will be equipped with an 850-hp., 6-cylinder, 4-cycle, 700-r.p.m., Alco diesel engine driving a Byron Jackson explosionproof centrifugal pump to handle 30,000-35,000 bbl. at 1,000 psi. through an 8-in. line. Each pumping unit is equipped with Farrell-Birmingham gears. Starting and stopping is to be done with automatic equipment. The stations are scheduled for completion December 1. Engines and pumps are to be painted white.

This system is batching more than 25 products through the line ranging from propane to coking cycle stock and including painters naphtha, solvents, and all types of gasoline. The company has been pumping propane for 7 years.

## Sinclair Prepares for Products Line From Houston

Sinclair Refining Co. is preparing for the construction of a products pipe line to extend north from Houston which will connect with the Corpus Christi-San Antonio-Austin system, now under construction at a point near Bryan, Tex.

Pipe for the Houston outlet is expected to start arriving in September for construction which will be pushed for early completion. The Houston system is to extend through the Dallas-Fort Worth area to Kansas City and St. Louis.

## Big-Inch Pipe Supply To Be Short Until 1952

Backlogs of orders for large diameter pipe for cross-country oil and natural-gas lines will require 3 years to fill, and projected pipe lines for which materials have not yet been ordered will keep the pipe-manufacturing industry busy until 1952, it is indicated by figures released recently by A. O. Smith Corp., Milwaukee, one of the largest pipe manufacturers.

Company officials said its backlog now aggregates 6,000 miles of pipe. The company's facilities, they said, have a capacity for producing between 225 and 250 miles of various sizes a month.

"If we could get enough steel to operate at capacity we could run out our backlog in 33 to 36 months," an official said, but he added that present allocations from steel producers now are enough only for operation at 40 per cent capacity.

Many customers, he said, are buying the steel and shipping it to manufacturing plants. Smith officials estimated that on this basis the company would be able to operate at capacity through December.

Most orders are for pipe of from 20 to 26-in. diameter.

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The Free Pump ends pump pulling, costly downtime, and lost production. It eliminates the need for derricks and expensive servicing equipment. Lengthens the life of subsurface tubing by eliminating excessive wear and by keeping tubing clean. And, it utilizes the full efficiency of *Fluid Power* Pumping.

The passing of pump pulling ends an operation that the industry says annually takes 25% of the pumping operating dollar.

The Free Pump allows undreamed of versatility in your operations. Permits you to quickly and inexpensively change pumps, or to switch pumps from well to well. Big volume pumps no longer need be left in small volume wells. Cost is eliminated as a factor in determining your pump changes. Production planning is freed of the fetters of immobile pumping equipment.

Producers, now using *Fluid Power* Pumping, will find their equipment adaptable to Free Type Pumping. And at low cost!

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# Exploration and Drilling

## Why Drill There?

EVERY well that is drilled is drilled where it is because at least one man, usually more than one, is convinced that it has a good chance of finding oil at that particular spot. This is patent in the case of wildcats but it is also true even of edge-well offsets in a field being developed.

Neither individual operators, nor companies, whether they be large or small, drill wells in a particular area because there is a demand for oil in that area. If there is a demand for oil in an area where some one believes there is a chance of finding oil, that individual has an easier time financing the well. But if he doesn't believe there is a good chance of finding oil, he doesn't drill, regardless of how easy it might be to finance part of the cost. So the industry, as a collection of individuals, drills and finds oil where it can, and then transports it to the area where the demand exists.

This might seem like a statement of the obvious to most exploration men, but they would be surprised to find how many people do not understand the motives that are back of exploration wells.

The current situation in Illinois and surrounding area is a good illustration. All forecasts of supply and demand are agreed that there will be at least a fairly tight squeeze on the supply of refined products in at least parts of former PAW District 2. There is agreement that this will be due, not to lack of refining capacity, but to lack of transportation to bring crude available in West Texas to the refineries that need it in District 2.

There is transportation available from Oklahoma, Kansas, and Illinois for more oil, if oil were available in larger quantities in those areas. There is therefore every reason for more drilling activity in Oklahoma, Kansas, and Illinois. That is, there is every reason from the standpoint of the demand for oil. But what about the motives that really cause men to drill wells?

Drilling is up sharply in Oklahoma, moderately in Kansas, and off around 10 per cent in Illinois. It is off in Illinois, where increased crude supplies would be most valuable. It is off in spite of some factors which made quite a few people last December and January anticipate increased drilling. One major factor was that many 10-year leases taken during the Illinois basin boom were expiring. It was quite common to hear expressions to the effect that when the majors turned loose of their expiring blocks, numerous independents would pick up new acreage, work out deals, and drill them. Others thought the majors would make favorable farmout deals to get independents to test blocks about to expire.

But it develops that the men who drill wells in Illinois just don't have too many spots where they feel like a well has a good chance of producing. Therefore, in spite of the demand for oil, in spite of increased acreage available, in spite of probable favorable-term farmouts, they just don't feel like drilling as many wells as they did last year.

In Oklahoma they apparently have many more spots they feel like drilling, and they are drilling them. But the market for crude would absorb even more wells, if they produced. So they aren't drilling as many wells in Oklahoma as the demand for oil would justify. They aren't drilling them because they haven't got that many places where they feel pretty sure of getting a producer.

It is true that pipe shortages have probably retarded Oklahoma and Kansas drilling to some extent. But in view of the demand for crude in these areas, and the probable squeeze in District 2, various operators would have switched more pipe from Texas locations to Oklahoma and Kansas, if they had promising-looking locations. The drilling pace, as always, continues to be in line primarily with the prospects of getting a good well.

## EASTERN TEXAS

### Humble Test Makes Distillate Production

DALLAS.—Humble Oil & Refining Co. 1 P. H. McKnight, deep test north of Woodbine production in Hawkins field, Wood County, was brought in last week as a distillate producer in the Rodessa section, after more than a year's operation. Work was started on the test in the lattter part of May, 1946.

Bottomed at 14,629 ft., and tested to total depth, operators plugged back to 8,970 ft., set packer at 8,869 ft., and spotted 500 gal. of acid opposite the formation between 8,965-35 ft. The well then flowed and was swabbed through tubing. Ten trips with the swab reached 3,500 ft. It came in the afternoon of July 9. While shut in the tubing pressure increased to 1,800 lb. and operators opened it through ¾-in. choke. Flowing distillate, water and mud, the daily rate was 1,400,000 cu. ft. of gas, with tubing pressure ranging from 140 to 170 lb. On a ¼-in. choke the well cleaned itself in 4 hours, and on a 6-hour test flowed gas at the rate of 1,200,000 cu. ft. a day, and produced 11.04 bbl. of 52°-gravity distillate. Flowing tubing pressure was 1,250 lb.

Two Anderson County wildcats reported some showings of oil. Continental Oil Co. 1 F. M. Royall, 2½ miles northwest of Slocum, was drilling below 7,971 ft. A drill-stem test with packer set at 7,923 ft., open 45 minutes, produced a slight blow at the surface immediately, which died in 20 minutes, and recovered the water cushion and 20 ft. of drilling mud having a very slight show of oil.

Three miles east and slightly south of Blackfoot, Sanders & Murchison 1 R. F. Broadway was bottomed at 8,367 ft. in sandy limestone of the upper Glen Rose. Operators reported a drilling break at 8,365-67 ft., and samples showed sandy limestone which drilled at 3 minutes per foot. Dark brown oil was showing on pits and operators were circulating, waiting on orders.

In Panola County, 3 miles east of Deadwood, Continental 1 Louis Werner tested at 5,191-5,205 ft., recovering 125 ft. of mud having a slight oil odor, and 300 ft. of salt water in 15 minutes. In Cherokee County, north of Ponta, Delta Drilling Co. 1 J. Bailey was drilling below 4,035 ft. in shale. Sample tops were Navarro shale 2,770 ft., Pecan chalk 3,320 ft., Pecan gap 3,690 ft.

**EAST TEXAS WILDCAT FAILURE**

McLenan County: Lon H. Smith 1 fee, R. D. Price Sur., 3 mi. NE. West, dry, TD 650 ft., top Woodbine 615 ft., no shows.

## SOUTHWEST TEXAS

### Aransas Discovery Has Two Pay Zones

CORPUS CHRISTI.—The William Herbert Hunt Trust Estate 1 Spencer-Crane, discovery well of a new oil and gas field in Aransas County, approximately 4½ miles north of Rockport, is being dually completed as a gas-condensate and oil well.

The gas-condensate sand was perforated at 7,058-65 ft., and the oil sand at 7,126-36 ft. Drill-stem test in the lower perforations flowed 76.5 bbl. of oil in 6 hours through 3/16-in. choke, with 1,175-psi. working pressure, and recovered 1,550 ft. of pipe-line oil and 40 ft. fresh water. Previous tests in perforations at 7,482-89 ft. and 7,467-75 ft. had showed salt water. Total depth is 8,370 ft. The first gas-condensate sand was topped at 7,126 ft. This

PENBERTHY
SUMP PUMPS

Used wherever seepage water accumulates, the Penberthy Automatic Electric Sump Pump and the Penberthy Automatic Drainer (water or steam operated) have demonstrated their superiority in this service. Simple and rugged design—copper and bronze construction throughout.

PENBERTHY INJECTOR CO.
DETROIT, MICH. Canadian Plant WINDSOR, ONTARIO

Why THE INDUSTRY'S LEADING CENTRIFUGE?

BECAUSE:

Heavy duty, ruggedly constructed and extremely simple in design . . . Gets quick, accurate results . . . produces required speed with less effort . . . Cranks and heads of 100 CC and 15 CC size machines interchangeable . . . Meets A.S.T.M. Standard Method D-96 and A.P.I. Code No. 25 requirements.

W·H·CURTIN & CO. Inc
DEPT. "C"
HOUSTON, TEXAS . . . NEW ORLEANS, LA.

well is located in the C. O. D. Gilliland Survey.

Two new oil pay zones on the south flank of La Gloria field in Brooks County have been opened by Ralph E. Fair, Inc. and Jack Woodward, Inc. 10 Fair-Woodward fee. This is an old well drilled deeper, originally completed in 1942 as La Gloria Operators Committee 5 South La Gloria unit for a dual-sand, gas-condensate well at 6,770-90 ft. and 5,995-6,030 ft., old total depth 7,400 ft. It was deepened to a new depth of 8,306 ft. to open two new pay zones. The gage from the upper perforations (La Gloria-Hammond sand) was 183 bbl. of 41°-gravity oil per day through 9/64-in. choke, gas-oil ratio 925, no water, casing pressure 1,080 psi.; and the gage from the lower sand was 171 bbl. of 42.6°-gravity oil per day through 7/64-in. choke, gas-oil ratio 1,355, tubing pressure 1,660 psi., no water in the flow. This well is located in Lot 4, Section 12, Falfurrias Farm & Garden tracts.

A new deep gas sand at Los Indios field, Hidalgo County, has been opened by The Chicago Corp. 3 Richard King estate, which gaged 1,325,000 cu. ft. of gas per day on open flow, with shutin pressure of 3,875 psi. The well had flowed 1,272,000 cu. ft. of gas on ¼-in. choke, with 830-psi. tubing pressure, and 739,000 cu. ft. of gas per day through ⅛-in. choke, 1,975-psi. tubing pressure, through perforations at 8,447-63 ft. Total depth is 9,130 ft., with 5½-in. casing at 8,882 ft. This well is located in Tract 9, "Los Indios Pasture" in San Salvador del Tule Grant.

Magnolia Petroleum Co. 4 T. S. Proctor, new oil well on southeast flank of La Gloria field in Brooks County, is producing on gas-lift from a new oil pay zone, called the Proctor sand. It jetted 24.3 bbl. of 42°-gravity oil per day through ¼-in. choke, with 5,000 gas-oil ratio, with 560-psi. tubing pressure, casing sealed, no water. Production is through perforations at 7,483-93 ft. This well is located in Lot 11, Block 2, Falfurrias Farm & Garden tract.

Sunray Oil Corp. 1-D C. T. Hewitt, in the southwest extension area of South Haldeman field, in Jim Wells County, has indicated another new pay zone for the field. On drill-stem test at 4,195-4,203 ft., open 30 minutes, with 85-psi. working pressure, recovered 1,450 ft. oil, bottom-hole pressure flowing 1,150 psi., and test at 4,207-11 ft., open 30 minutes, with 65-psi. working pressure, recovered 1,530 ft. of oil. In addition, the well has tested good for gas production at 3,853-63 ft. and 4,249-70 ft. This well is located in Section 51, R. P. Haldeman Subdivision.

### SOUTHWEST TEXAS SUCCESSFUL WILDCATS

Brooks County: New oil pays, La Gloria pool—Ralph E. Fair, Inc. and Jack Woodward, Inc. 10 Fair-Woodward fee, two new pays in Lot 4, Sec. 12, Falfurrias Fm. & Gdn. Trs., old well drilled deeper (formerly La Gloria Operators Comm. 5 South La Gloria Unit, OTD 7,400 ft., new TD 8,306 ft., top pay 6,882 ft., perf. 6,882-92 ft., La Gloria-Hammond sand), IP 183 bbl. oil per day through 9/64-in. choke, gas-oil ratio 925, CP 1,080 psi., gravity 41°. Top pay 6,960 ft., perf. 6,960-90 ft. (La Gloria-Atlee "A" sand), IP 171 bbl. oil per day through 7/64-in. choke, gas-oil ratio 1,355 ,TP 1,660 psi., gravity 42.6°, no water.

Hidalgo County: New gas pay, Los Indios pool—Chicago Corp. 3 Richard King Est., in San Salvador Del Tule Grant, top pay 8,447 ft., TD 9,130 ft., perf. 8,447-63 ft., IP 1,325,000 cu. ft. gas per day on open flow, and 1,272,000 cu. ft. gas per day through ¼-in. choke, TP 830 psi., no water.

### SOUTHWEST TEXAS WILDCAT FAILURES

Atascosa County: Southern Minerals Corp. 1 Rosena Campbell, in Moses Hesskew Sur. 198, 7½ mi. NW Fashing, dry, TD 5,900 ft.

Duval County: Taylor Refg. Co. 1-H E. A. Parr, 7 mi. NW San Diego, in Sur. 113, dry, TD 4,840 ft.

Hidalgo County: Royal Oil & Gas Corp. 1 W. R. Jackson, in Porcion 41, 4 mi. NE Sullivan City, dry, TD 5,010 ft.

Kenedy County: Humble 1-B John G. Kenedy, Jr., in Kenedy Pasture Co. 1st Addition to Sarita Township, in El Paistle Gr., dry, TD 8,439 ft.

San Patricio County: Bridwell Oil Co. 1 M. T. Beall, in M. P. & J. N. Delgado Gr., Mathis area, dry, TD 5,217 ft.

Seaboard Oil Co. of Dela. 1 A. A. Smith, in John W. Paup Sur., 1½ mi. SW of Odem, dry, TD 9,222 ft.

Southern Minerals Corp. 1 J. H. Johnson, Sec. 35, Geo. H. Paul's subd. of Welder Ranch, 6 mi. N Edroy, dry, TD 6,516 ft.

Starr County: Humble 2 E. G. Gonzales, TTRR Sur. 373, 9¾ mi. SE Cuevitas, dry, TD 5,220 ft.

Zapata County: Government Wells Oil Co. 2 Virginia Garcia, in J. V. Borrego Gr., 18 mi. SW Aguilares, dry, TD 945 ft.

Zapata County: J. L. Hatcher 1 Anastacio Garcia, in Charco Redondo Gr., 15 mi. E Zapata, dry, TD 991 ft.

A. M. Lacey 1 Salome Martinez, in Blas. Maria Gr., 20 mi. SW Mirando City, dry, TD 2,825 ft.

## SOUTH LOUISIANA

### Texas Co. Opens New Deep Gas Production

NEW ORLEANS.—The Texas Co. has opened new deep gas production 4 miles west of Bayou Sale field production and out in Atchafalaya Bay, Iberia Parish. The discovery is 10 State-Rabbit Island on Lease 340. Total depth is 11,919 ft., and 7-in. pipe was cemented at 10,671 ft. with perforations at 10,545-68 ft. On initial production test it gaged 5,535,000 cu. ft. of dry gas per day through a ⅛-in. choke with 3,950-psi. flowing pressure on the tubing and 4,200-psi. shutin pressure.

In Terrebonne Parish, Union Oil Co. of California 1 J. C. Dupont, Inc., new sand and 1½-mile north extension discovery to Houma gas and condensate production, has been completed for a potential gage of 130 bbl. of condensate, 50.1°-gravity, per day through a 16/64-in. choke with 6,461,000 cu. ft. of gas with 4,750-psi. pressure. Production is through perforations at 11,930-950 ft.

A new gas pool in Johnsons Bayou area, Cameron Parish, has been opened by Stanolind Oil & Gas Co. 1 George J. McManus, located in 20-15s-14w, 9 miles southwest of Cameron Meadow field, and approximately ½ mile north of Gulf of Mexico shore line. Drilled to a total depth of 9,637 ft., with plug-back depth at 4,510 ft., this well flowed an initial production of 3,200,000 cu. ft. of gas per day through a ¼-in. choke, tubing pressure 1,700 psi., no water, through perforations at 4,480-88 ft.

Texas Co. 1 Lafourche Basin Levee District, deep wildcat test in the Queen Bess Island area of Jefferson Parish, 1½ miles west of the No. 1 State, gas well, and in Section 30-20s-25e, is at a total depth of 15,523 ft. and is running 5½-in. pipe after logging hole to the bottom.

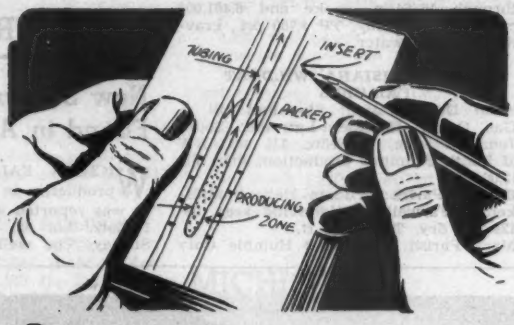
### SOUTH LOUISIANA SUCCESSFUL WILDCATS

Cameron Parish: New gas pool, Johnson Bayou area—Stanolind Oil & Gas Co. 1 George J. McManus, 20-15s-14w, 9 mi. SW Cameron Meadow field, approx. ½ mile N Gulf of Mexico shore line, TD 9,637 ft., PB 4,510 ft., perf. 4,480-88 ft., IP 3,200,000 cu. ft. gas per day through ¼-in. choke, TP 1,700 psi., no water.

Iberia Parish: New gas pool, Rabbit Island area—Texas Co. 10 State-Rabbit Island, Lease 340, in Atchafalaya Bay, 4 mi. W. Bayou Sale field production, TD

# Installing orifice inserts for gas lift in League City area demonstrates utility of Otis Tubing Perforator

**1** "When one of a major company's wells in the League City field quit flowing, we were called to discuss the installation of orifice inserts in the tubing walls for gas lift, through use of the Otis Tubing Perforator. The well had been completed with the casing perforated opposite the producing sand and a packer set above the perforations. It had been produced through the tubing until eventually bottom-hole pressure decreased to a point where it would not flow.




**2** "I showed them that with the Tubing Perforator we could install orifice inserts of selected sizes at any depth, and that running the tool under pressure on a steel measuring line eliminated the necessity of moving the tubing at the risk of disturbing the packer setting. I also explained that we didn't need a derrick, tubing crew, etc., and that the entire operation was safe (no explosives), inexpensive, and would take only a few hours.

**3** "Following the company's approval we then checked well records for bottom-hole pressure and volume and gravity of the fluid to be lifted. With this data, we then determined the static-fluid level and calculated a fluid head which the available gas pressure would lift. It was immediately evident that we would have to install inserts at several depths in order to "relay" the oil column from the lowest insert to the next one above, etc., and create a continuous flow.

**4** "Using our regular high pressure wire line equipment, we ran the Perforator equipped with a 7/64" orifice insert to 1800 feet and, through the usual procedure of manipulating the wire line at the surface to create a jarring action, drove the tapered insert into the tubing wall. This same operation was repeated at 2300 feet with a 6/64" orifice insert; at 2800 feet with a 5/64" orifice insert; and at 3300 feet with a 4/64" orifice insert. Injection gas was then turned into the casing and the well began a continuous flow.

**5** "At the last report the well was still producing on gas lift in a satisfactory manner and the company was very well pleased with the results. This particular job certainly proved the efficiency and simplicity of operation of our Perforator for use in operations of this type."

**This is the third in a series of advertisements covering actual installations of Sub-Surface Controls and subsequent service as described by Otis Pressure Control, Inc., field personnel. Except for necessary deletion of company and trade names these reports are unedited. For further details on equipment and service, write Otis Pressure Control, Inc., 6612 Denton Drive, Dallas.**

(T-4)

PRESSURE CONTROL · OTIS · SERVICE — EQUIPMENT

T. M. REG.

**OTIS PRESSURE CONTROL, INC.**

FIELD OFFICES: TEXAS: HOUSTON, CORPUS CHRISTI, and LONGVIEW. OKLAHOMA: OKLAHOMA CITY. NEW MEXICO: HOBBS. LOUISIANA: NEW IBERIA

OTIS ENGINEERING CORPORATION—MANUFACTURE AND DEVELOPMENT

DISTRIBUTORS: OTIS PRESSURE CONTROL, INC., DALLAS, TEX.; OTIS EASTERN SERVICE, INC., BOLIVAR, N. Y.; WESTERN PRESSURE CONTROL, LOS ANGELES, CALIF.

11,919 ft., perf. 10,545-568 ft., IP 5,535,000 cu. ft. gas per day through a ¼-in. choke, TP 3,950 psi., SIP 4,200 psi., no water.

Terrebonne Parish: New gas-condensate pay Houma pool—Union Oil Co. of Calif. 1 J. C. Dupont, Inc., 45-16s-17e, 1½ mi. N gas-condensate production, top sand 11,930 ft., TD 12,074 ft., perf. 11,930-950 ft., IP 130 bbl. condensate per day through 16/64-in. choke and 6,461,000 cu. ft. gas per day, TP 4,750 psi., gravity 50.1°, no water.

**SOUTH LOUISIANA WILDCAT FAILURES**

Jefferson Davis Parish: Stanolind Oil & Gas Co. 1 Houssiere-Latreille, South Jennings area, 9-10s-3w, 1½ mi. NW of South Jennings production, dry, TD 12,006 ft.

St. Charles Parish: William Helis 2 Milliken & Farwell, in Hahnville area, 29-12s-20e, dry, TD 10,034 ft.

St. Mary Parish: Humble 2 Humble Cote Blanche-John M. Caffery fee, in Cote Blanche area, 10-15s-7e, dry, TD 15,140 ft.

Vernon Parish: Humble 1 Anderson-Post Hardwood Lbr. Co., Inc., et al, in Hawthorne area, 11-2n-11w, 2 mi. E Sandy Creek and 5 mi. E Sabine River, dry, TD 12,159 ft.

## N. CENTRAL TEXAS

### New Strawn Production Found in Archer County

WICHITA FALLS.—New Strawn sand production in east central Archer County was reported at Panhandle Refining Co. 1 Zotz, Lot 52, Block 3, Clark & Plum Survey. The well was shot with nitro at 4,050-84 ft. No production test had been made but operators estimated it good for 25 to 50 bbl. of oil a day, and were installing pumping equipment. Location is 3 miles southeast of the town of Scotland, and north of the shallow Kadane (Cisco, Pennsylvanian) field. A ½-mile south offset to the discovery was staked by S. D. Johnson, Wichita Falls, in Lot 55, Block 3.

In Montague County, 3 miles southwest of Stoneburg, Youngblood & Foree 1 Howard logged conglomerate with stain and odor of oil at 6,048-60 ft. Operator took a 30-minute drill-stem test of that section which recovered 120 ft. of mud having a slight show of gas. Bottom-hole pressure rose to 2,800 lb. in 10 minutes. It was drilling ahead below 6,073 ft. on last report.

In northern Archer County, Alexander Goldsmith 1 Kemper, Block 63, 2½ miles northwest of Holliday, found top of the KMA limestone at 4,021 ft., and sand from 4,104-14 ft. A 30-minute drill-stem test on the sand returned only a small amount of oil and gas-cut mud. Cored on down to 4,123 ft., the return was 8½ ft. of sand showing oil. Then a second 30-minute test of the section recovered 105 ft. of oil and gas-cut mud. Operators decided to drill ahead before making further tests.

Other wildcat reports from North Texas included: Denver Producing & Refining Co. 1 Luse, northeastern corner of Cooke County, drilling below 5,583 ft. in shale. Grace & Grace 1 Edwards, 2½ miles northwest of Scotland, Archer County, drilling below 5,250 ft. in saturated Caddo limestone, topped at 5,212 ft. R-G Drilling Co. 1 Kisinger, Baylor County, 8 miles southeast of Seymour, drilling below 3,467 ft. in shale.

**NORTH CENTRAL TEXAS SUCCESSFUL WILDCATS**

Young County: L. T. Burns 1 R. Campbell "C," Sec. 1,376, TE&L Sur., 5 mi. NE Olney, flowed 156 bbl. 43°-gravity oil in 16 hours, 15/64-in. choke, tubing pressure 100 lb., GOR 550:1, Caddo limestone 4,464-83 ft., TD 4,605 ft.

**NORTH CENTRAL TEXAS WILDCAT FAILURES**

Archer County: Perry Browning 1 Kenmaier, T. P. Martin Sur. A-758, 1½ mi. W Huff Station, dry, TD 2,333 ft. in shale.

A. R. Dillard 1 S. B. Dycus, Sec. 1,894, TE&L Sur., 6 mi. S Windthorst, dry, TD 4,208 ft.

A. P. Kouri 1 C. A. Crawford, Blk. 152, J. W. Harris Subd., 2 mi. SW Archer City, dry, TD 1,387 ft. in shale, sand with show oil 1,300-02 ft., limestone with show oil 1,340 ft.

J. C. Man, Jr. 1 J. H. Robertson, J. Lewellyn Sur., A-256, 10 mi. SW Archer City, dry, TD 1,444 ft. in water sand, sand with show oil 1,395 ft.

Cooke County: J. D. Lewis 1 R. W. Trew, J. Davis Sur., A-331, 8½ mi. S Muenster, dry, TD 2,816 ft. in shale.

Foard County: Magnolia Petroleum Co. 1 A. G. Bell, Abram Frisby Sur., 9 mi. NE Foard City, dry, TD 5,820 ft., Wichita 800 ft., Canyon limestone 3,600 ft. Reef 3,740 ft., limestone with show oil 4,810-23 ft., show oil 4,845-61 ft., DST recovered salt water, Mississippian 5,530 ft., Ellenburger 5,815 ft.

Montague County: A. R. Dillard 1 W. M. Haupt, N. B. Zumwaldt Sur., A-1,057, 5½ mi. SE Nocona, dry, TD 6,008 ft., no tops reported.

Wichita County: Frank Wood 1 Florence Singletary, CTRR Sur., A-48, 7½ mi. SE Burkburnett, dry, TD 1,602 ft., sand with slight show oil 180 ft.

Young County: Star Oil Co. 1 R. B. Whittenburg, W. Dougherty Sur., A-1,410, 4 mi. SE South Bend, dry, TD 4,077 ft., black limestone 3,503 ft., show oil 3,710 ft., bailed 2 gal. oil an hour.

**WEST CENTRAL TEXAS SUCCESSFUL WILDCAT**

Stephens County: Lloyd Oil Co. 1 Eugene Tipton, Nancy Williams Sur., A-920, 7 mi. S Woodson, flowed 52 bbl. 42.5°-

J-M
Kearsarge 166
LUBRICATES ITSELF
. . . lasts longer in steam service

This rod packing beats both heat and wear because it is continuously self-lubricated.

Its accordion-folded center block forms a reservoir for the preserving lubricant, keeps the packing pliable and increases its service life. Kearsarge 166 gains additional resiliency from its red rubber expansion back—thus, seals better with less takeup.

For greater wear resistance, the whole is wrapped in a double fold of long-wearing asbestos cloth.

Like Kearsarge 166, each Johns-Manville Packing is designed to do its particular job better. That's why J-M Packings are so popular in the oil industry. At your Supply House or write Johns-Manville, Box 290, New York 16, New York.

JM PRODUCTS

Johns-Manville PACKINGS & GASKETS

gravity oil in 6 hours, 12/64-in. choke, tubing pressure 250 lb., casing pressure 640 lb., Mississippian limestone 4,524-34 ft., TD 4,713 ft., elevation 1,220 ft.

**WEST CENTRAL TEXAS WILDCAT FAILURES**

Jones County: Eastland Oil Co. 1 C. R. Foster, Sec. 24, D&DA Sur., 1 mi. W Avoca, dry, TD 3,390 ft., limestone with slight show oil 2,970 ft.

Trinity Martex 1 Frank Carter, Sec. 32, Blk. 18, T&P Sur., SW cor. of county, dry, TD 3,112 ft., Noodle Creek 2,415 ft., show oil 2,432 ft., Swastika sand 3,071 ft.

Shackelford County: L & G Oil & Royalty Co. 1 G. DeLoposse, Sec. 9, Blk. 8, T&P Sur., 10 mi. E Albany, dry, TD 4,462 ft., Caddo 3,545 ft., Ellenburger 4½355 ft., DST 4,350-82 ft., recovered oil and gas-cut mud.

# MISSISSIPPI

## Yazoo County Wildcat Dry at 7,055 Ft., TD

JACKSON.—Carter Oil Co.'s Yazoo County wildcat, the No. 1 Medie Morgan, 5 miles northwest of the city, in 9-12n-3w, was dry at total depth of 7,055 ft., in what was considered the Tuscaloosa sand. The No. 1 Morgan checked approximately 50 ft. lower on top of the sand section which carried some saturation, at Carter's 1 Day, a northeast offset location. The No. 1 Morgan was said to have cut a 115-ft. fault in the Midway sand, topped at 4,067 ft.

Two miles northeast of Bentonia, Yazoo County, R. T. McDermott 1 Pauline Gaddis, 32-10n-1w, was coring below 6,224 ft. in sand and shale. Electric log showed the well to be running 100 ft. low to another test to the south. Gas rock was found at 4,775-89 ft.

In Jones County, Gulf Refining Co. 1 Major, 29-6n-11w, continued coring, below 12,655 ft., in sandy shale. Cores at 12,595-12,605 ft. recovered 1 ft. of brown limestone and 5 ft. of red and green shale, with no shows. At 12,605-15 ft. the recovery was 3½ ft. of black and gray shale with a slight oil and gas odor, and at 12,615-20 ft. there was sandy shale, with no shows of oil.

In Marion County, Humble Oil & Refining Co. 1 E. R. Ford, 20-1n-17w, was dry at 9,650 ft. in the Comanche. An oil show was reported in a lower Tuscaloosa stringer sand at 8,892-96 ft., but was not considered enough to test.

**MISSISSIPPI WILDCAT FAILURES**

Chickasaw County: Davidor & Davidor 1 H. B. Carter, NW SE SW 24-12s-4e, dry, TD 3,046 ft., Eutaw 520 ft., Tuscaloosa 748 ft., Mississippian 2,340 ft., original TD 2,642 ft., first completed February 17, 1947, moved in cable rig and cleaned out, well flowed gas and water by heads every 15 minutes, drilled out to TD 3,046 ft. and tested throughout hole but failed in attempts to shut off salt water.

Marion County: Humble Oil & Refining Co. 1 E. R. Ford, 20-1n-17w, dry, TD 9,630 ft., Wilcox 3,006 ft., Midway 5,932 ft., Selma 6,740 ft., Austin 7,559 ft., Eutaw 7,840 ft., Marine Tuscaloosa 8,520 ft., Massive sand 9,200 ft., Comanche 9,426 ft., elevation 134 ft.

Washington County: C. H. Murphy, Jr. 1 E. J. Ganier, SE NW 30-15n-6w, dry, TD 4,466 ft.

C. H. Murphy, Jr. 1 W. B. Swain, SW SW 29-15n-5w, dry, TD 4,312 ft.

Yazoo County: Carter Oil Co. 1 Medie Morgan, SW NE 9-12n-3w, dry, TD 7,055 ft., Wilcox 2,018 ft., Midway 4,067 ft., Selma 4,822 ft., Eutaw 5,707 ft., Tuscaloosa 6,321 ft., Massive 6,835 ft., elevation 115 ft.

**ALABAMA WILDCAT FAILURES**

Choctaw County: Daryl Davis 1 S. H. Bolinger & Co., NE SE 15-11n-3w, dry, TD 4,841 ft., Salt Mountain 1,230 ft., Midway 1,687 ft., chalk 2,154 ft., Selma 2,175 ft., Eutaw 3,254 ft., Marine Tuscaloosa 4,292 ft., Lower Tuscaloosa 4,662 ft., Massive sand 4,788 ft., no shows, elevation 247 ft.

Clarke County: Shell Oil Co., Inc., 1 C. C. Brooks, NW NE 11-8n-1e, dry, TD 5,005 ft., no tops available.

Marengo County: George Ballio 1 J. L. Bedsole, SW SE 18-13n-1e, dry, TD 3,399 ft., chalk 1,040 ft., Eutaw 2,015 ft., Tuscaloosa 2,486 ft., Massive sand 3,268 ft., elevation 200 ft.

# MICHIGAN

## Michigan Operators Make 13 Locations

SAGINAW.—Michigan oil and gas operators announced 13 new locations while reporting 15 completions the past week. New oil production was mostly from three new producers in Garfield-Newaygo field at hourly initial rates of 60, 65, and 35 bbl. The only other oil well completed was in Claybanks-Oceana, flowing 120 bbl. the first 6 hours.

Two of the seven dry holes were wildcats; the other four completions were gas wells in Clare, Livingston, and Mecosta counties.

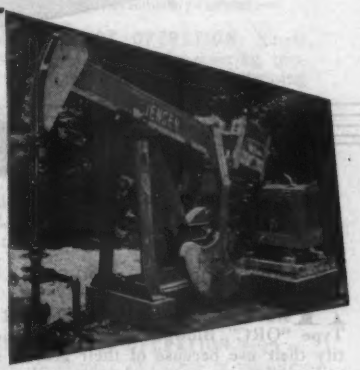
New locations were one each in Mont-


**WHY have JENSENS enjoyed world-wide acceptance for 27 YEARS?**

Principally because the product does the work you require—that of pumping oil economically. Also, service and spare parts stand behind every unit we build. Our sales policy is fair to everyone—large and small producers alike.

Policies and performance like this is your assurance of adequate return on your investment whenever a Jensen is installed.

Contact your local dealer or write us for details on sizes and capacities.



**JENSEN** BROTHERS MFG. CO. *Coffeyville, Kansas*

EXPORT OFFICE: 50 CHURCH ST., NEW YORK CITY

**FOR SALE**

**New Couplings for 4" and 6" Grooved Pipe**

**50,000 pcs. 4"** **120,000 pcs. 6"**

These Couplings complete with new bolts and gaskets, part Gruva-grip and part Victualic manufacture.

***Attractive prices!***

**Albert Pipe Supply Company**
Berry & North 13th St.,
Brooklyn 11, N. Y.
Phone: Evergreen 7-8100

**L. B. Foster Company**
P. O. Box 1647
Pittsburgh 30, Pa.
Walnut 3900

**Albert & Davidson Pipe Corp**
2nd Ave. — 50th, 51st St.,
Brooklyn 32, N. Y.
Phone: Windsor 9-6300

# CAMERON

*(Type "QRC")*

*Quick Ram Change*

# BLOWOUT PREVENTERS

*Pay for themselves in the rig time they save!*

Aside from the superior mechanical features of Cameron Type "QRC" Blowout Preventers which alone would justify their use because of their greater safety and all round utility, these new control units will actually pay for themselves on a few wells thru reduced ram change time. Whereas the large sizes of other models required up to 10 hours, or more, for changing rams, this operation with the "QRC" model requires only a few minutes. With from 3 to 5 ram changes required in drilling the average Gulf Coast well, for example, the saving in rig time is substantial. For this reason, one of the world's largest owners of drilling rigs is presently replacing all of his blowout preventers with Cameron Type "QRC".

Other "QRC" features include: High ratio of closing pressure to well pressure—8 to 1 as compared with 3 to 1 on earlier models; compact design—lower overall height, less weight, easier to install and transport; 6000 and 10,000 lbs. test pressure models in 6", 8" and 10" sizes; patented self-feeding ram packers; fluid pressure operation and other time-tested features which, for many years, have established Cameron as the standard of comparison in the pressure control field.

## CAMERON IRON WORKS, INC.

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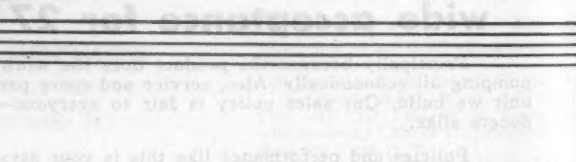
Export: 74 Trinity Place, New York, N. Y. West Texas: Odessa, Telephone 1710. Oklahoma: 310 Thompson Bldg., Tulsa. California: 1442 Hayes Ave., Long Beach (7-2036). Wyoming: 356 N. Wolcott St., Casper. North Louisiana: Bossier City (P. O. Box 425.)



## QUICK FACTS ABOUT "QRC"

- Quick Ram Change—Whereas many hours of hard labor were required for this operation on earlier models, rams can now be changed in a matter of minutes.
- High Closing Ratio — 1000 lbs. closing pressure will close the rams against approximately 8000 lbs. well pressure!
- Well Pressure Equalized Front and Back of Rams—Well pressure is bypassed to rear of rams where it aids in closing, thus contributing to the more favorable high closing ratio.
- Weighs 30% Less Than "SDA" Models — Compact design facilitates transporting the unit as well as its assembly in the field.
- 10,000 lbs. Test pressure Models — 6", 8" and 10" sizes available in both 6000 and 10,000 lbs. test.
- Plus — Patented self-feeding ram packing, fluid pressure operation by remote control, self-centering rams and other time-tested mechanical features.

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Back in 1937, when the Peoples Water Service Company bought their first Layne Well Water System to serve the city of Warrington, Florida, they had only 263 connections. But Warrington, being a fine home city, grew larger and larger. By 1941 a second unit was needed, and being guided by an appreciation of known quality, none but a Layne Well Water System was to be considered. In 1945, connections had increased to 3,200, so again additional water supply was needed.

Peoples Water Service Company now have their third Layne Water System . . . one of the finest and most complete in the entire state. Powered with a 100 h.p. electric motor, turning at 1170 r.p.m., this new system is producing 1130 gallons of water per minute. The well is underreamed and packed with 20 yards of sized gravel.

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calm, Oceana, Allegan, Gratiot, Bay, Kent, Ionia, and Clare counties; and five in Newaygo.

**MICHIGAN WILDCAT FAILURES**

Bay County, Garfield Township: Chapman Oil Co. 1 Eigner, NE NE NE 20-16n-3e, dry in Berea, TD 2,058 ft.

Gratiot County, Hamilton Township: J. O. Mutch 1 Knickerbocher et al, C NW NW 3-10n-1w, dry in Marshall, TD 900 ft.

# TEXAS GULF COAST

## Tide Water Well Opens Gas-Condensate Pool

HOUSTON.—A new gas-condensate pool for Wharton County has been opened by Tide Water Associated Oil Co. 1 J. D. Hudgins, in GH&H Survey, Abstract 164, Block 39, 6 miles southeast of Lissie in what has been designated as West Bernard pool. Drilled to a total depth of 7,901 ft., with 5½-in. pipe cemented at 7,898 ft., with perforations at 6,720-22 ft. and 6,708-12 ft. for completion, where it flowed gas and condensate. Operators are waiting on official gage. Gas and condensate production also was indicated on a test through perforations at 7,811-13 ft. where it flowed an estimated 65 bbl. of condensate daily with 2,300-psi. pressure through ¼-in. chokes.

W. P. Taylor and Jos. Hornberger, Jr., have asked discovery allowable rights for their 1 A. A. Egg, new deep pay-zone discovery in the Harmon area (Ganado field) in Jackson County. On potential gage this well flowed 198 bbl. of 36.9°-gravity oil per day through a 5/32-in. choke, through perforations at 6,512-18 ft. with gas-oil ratio of 400, with no water in the flow. Tubing pressure was 750 psi., casing pressure 1,400 psi. This well is in the G. F. and M. T. Simons Survey 24, approximately ¼ mile southwest of the Gulfboard 1-A Maggie Branch well in Harmon field.

Stanolind Oil & Gas Co. 37 B. D. Rooke, deep test in La Rosa field, Refugio County, is setting liner to about 6,900 ft. for completion in a new deeper oil pay zone. Drilled to a depth of 9,524 ft., this well recovered 1,080 ft. of 40°-gravity oil on a drill-stem test at 6,844-53 ft., using ¼-in. chokes.

The Texas Co. 1 State Tract 130, northeast-extension gas well at Matagorda Bay field in Calhoun County, was gaged at 17,500,000 cu. ft. of gas per day on open flow. Total depth is 5,780 ft., with 7-in. casing set to 4,780 ft. and perforated in the 4,700-ft. gas sand for completion. This well is in the northwest corner of state tract 130 in Matagorda Bay.

A new shallow gas-producing sand in the West Louise area of Wharton County has been opened by Wirt Franklin in 1 M. L. Heard, located 2 miles north of Louise field and in the T. J. Winson Survey. Total depth is 6,450 ft., with production pipe set on bottom. Perforations were made in the 5,200-ft. level, and it has been completed as a gas well with 2,600-psi. flowing pressure on the tubing.

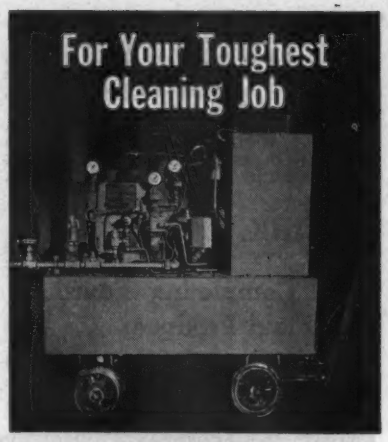
**TEXAS GULF COAST SUCCESSFUL WILDCAT**

Jackson County: New oil pay, Harmon pool W. P. Taylor and Jos. Hornberger, Jr. 1 A. A. Egg, in G. F. & M. T. Simons Sur. 24, top pay 6,514 ft., TD 6,860 ft., perf. 6,512-18 ft., IP 198 bbl. oil per day through 5/32-in. choke, gas-oil ratio 400, TP 750 psi., CP 1,400 psi., gravity 36.9°, no water.

**TEXAS GULF COAST WILDCAT FAILURES**

Bee County: Magnolia Pet. Co. 2 W. E. Erp, in Plummer-Wilcox area in N. Recendes Gr., dry, TD 3,350 ft.

Chambers County: Texas Co. 1 Kirby Pet. Co. NCT 2, in T&NO Sur. 1, Barbers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Hill area, ½ mi. off prodn. on north flank dome, dry, TD 10,477 ft.

Fort Bend County: Texas Gulf Producing Co. 1 J. F. Winston, in Randall Jones Sur., 4½ mi. N of Richmond townsite, dry, TD 7,824 ft.

Galveston County: Sam E. Wilson, Jr. 1-A Walter S. Davis, in Miguel Muldoon Sur., Lot 48, Subn. "E," 4½ mi. NE League City prodn., dry, TD 10,050 ft.

## LA.-ARK.

### Shell Completing Fourth Ora Field Producer

SHREVEPORT.—Shell Oil Co., Inc., last week was preparing to complete the fourth producer in Ora field of north-central Union Parish. It is the No. 1-A Frost Lumber Co. in 23-22n-1w, which was reported to have pumped 200 bbl. of oil a day. Other activity in the field includes Shell's 2 Frost and 4 Frost, which have set production pipe at 2,137 and 2,166 ft., and will be ready for completion. The No. 2 Frost is in 24-22n-1w, and the No. 4 is in 23-22n-1w. Feazel et al 1 J. C. Williams, a 1½-mile outpost test in 26-22n-1w, had set surface pipe on last report.

In Bienville Parish, Union Producing Co. and Pure Oil Co. 1 L. P. Frazier, 14-14n-6w, was coring below 4,657 ft. Sample formation tops were Paluxy 4,970 ft., and the East Texas Glen Rose at 4,020-30 ft. A Pettit test northeast of the Elm Grove field, Bossier Parish, M. A. Halsey 1-B Skidmore, 1-16n-11w, was drilling below 5,725 ft. in the Pettit. Cores at 5,297-5,312 ft. recovered porous oolitic limestone, with an oil and gas odor and spotted stain. A drill-stem test at 5,300-12 ft., open 30 minutes, recovered 105 ft. of gas-cut mud and salt water. Sample tops were, base Massive anhydrite 4,300 ft., Pettit porosity 5,300 ft., and the Travis Peak at 5,612 ft.

In Caddo Parish, C. H. Murphy, Jr. 1 W. C. Agurs was coring at 6,126 ft. in Travis Peak topped at 6,010 ft. Location is on the east side of Bethany gas field. Pan American Producing Co. 1 L. R. McGraw, 24-10n-8e, Catahoula Parish, was drilling below 4,886 ft. Side-wall cores at 2,444 ft. in the Sparta, recovered sand with a show of gas. The well is reported 400 ft. high on the Wilcox, topped at 2,857 ft.

In Lafayette County, Arkansas, W. H. Oberthier 1 M. Brown estate, 26-15s-24w, was drilling below 3,063 ft. Sample tops logged were Midway 706 ft., Nacatoch 1,360 ft., an dthe Tokio at 2,406 ft. In 8-15s-24w, west of Midway field, N. H. Wheless 1 T. R. Knighton was drilling below 3,455 ft. Two miles northwest of the town of Falcon, in 36-14s-23w, Hunt Oil Co. 1 Bodcaw Oil Co. was drilling ahead below 5,056 ft. It is a Smackover test scheduled to 6,000 ft.

**NORTH LOUISIANA WILDCAT FAILURES**

DeSoto Parish: Southern Producing Co. 1 G. E. Martin, SE SE SE 23-14n-15w, dry, TD 4,134 ft., Arkadelphia 1,350 ft., Nacatoch 1,410 ft., base Annona 2,045 ft., base Austin chalk 2,870 ft., Paluxy 3,100 ft. elevation 340 ft.

Union Parish: J. C. LeSage 1 P. P. Price, SW SW NE 32-22n-1w, dry, TD 2,197 ft., no shows.

**ARKANSAS WILDCAT FAILURE**

Columbia County: Byars Drilling Co. 1 Longine-Goode, SE NE 14-18s-20w, dry, TD 8,434 ft., Smackover 8,371 ft., porosity 8,386 ft., with salt water, elevation 340 ft.


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## CANADIAN FIELDS

### West Offset to Leduc Tests Porous Horizon

CHATHAM.—A fifth producer for the Leduc field is indicated with Imperial-Leduc 5, LSD 8, 21-50-26w4, coring below 5,020 ft. after a drill-stem test of a porous horizon in the Devonian at 4,975 ft. The test showed 304,000 cu. ft. of gas dropping to zero, after which 3,300 ft. of crude showed in the drill pipe. The well, offsetting Imperial-Leduc 1 discovery well to the west, had apparently not yet reached the first producing horizon in the latter, encountered around 5,066 ft.

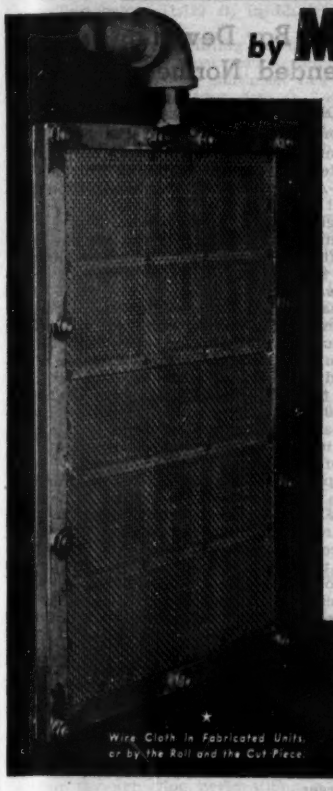
Imperial-Leduc 6, LSD 1, 22-50-26w4, is below 4,675 ft. and nearing completion with Imperial-Leduc 7, LSD 4, 15-50-26w4, below 4,080 ft., and Imperial-Leduc 8, LSD 7, 26-50-26w4, below 3,601 ft. The four original Imperial producers recently aggregated 731 bbl. of 40-41 gravity crude on a 24-hour test, under restricted production.

Among independent tests, East Leduc-South Brazeau 1, LSD 8, 9-50-25w4, is below 2,105 ft. Globe-Leduc West 1, LSD 6, 5-50-26w4, is below 405 ft. and Globe-Leduc 2, LSD 9, 34-50-26w4, is coring below 4,142 ft. B. A. Pyrcz 1, LSD 12, 25-50-26w4, is resuming with heavy equipment from 4,120 ft. after failing to get gas in the upper horizons. Okalta-Leduc 1, LSD 13, 7-50-25w4, is deepening below 3,663 ft., after a drill-stem test on the Viking sand showed 200,000 cu. ft. of gas.

South of the field, McColl-Frontenac 14-14 Wizard Lake, LSD 14, 14-48-27w4, is below 5,006 ft. and nearing potential production. Farther south, McColl-Frontenac 3-22, East Wetaskiwin, LSD 3, 22-46-23w4, is deepening below 4,743 ft. after an unsuccessful drill-stem test. McColl-Frontenac 1-20 Bigstone Lake, LSD 1, 20-46-26w4, is coring below 4,909 ft.

**Turner Valley.**—In the Turner Valley North Extension, Home-Millarville 26, outpost well, LSD 15, 18-21-3w5, with Madison

# FILTER CLOTH UNITS by MULTI-METAL



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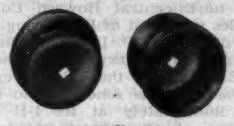

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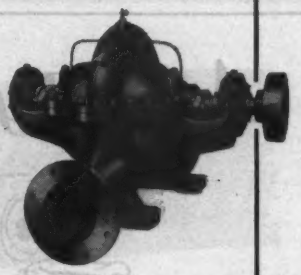

**CAPACITIES: 50 to 70,000 g.p.m.**

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**Peerless Type A Centrifugal Pumps**

General Specifications: *Capacities*, from 50 to 70,000 g.p.m.; *Heads*, 15 to 300 feet; *Sizes*, 2" to 42" discharge; *Drives*, electric and other types from 1 to 1000 h.p.; *Type*, single stage, double suction, split-case, ball bearing. REQUEST DESCRIPTIVE BULLETIN.

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at 8,541-8,970 ft., produced 3,720 bbl. natural flow of 41-42 gravity crude on 10½ days' test before acidizing. Home-Millarville is below 8,420 ft. after getting the lime at 8,175 ft. Four tests are drilling and one rigging up.

**Elk Point.**—In the North-Central plains area, Elk Point 5, LSD 9, 23-56-5w4, struck gas with some oil about 200 ft. in Lower Cretaceous at 1,358 ft., and is perforating and testing.

**Pakowki.**—In the Pakowki area, southern Alberta, McColl-Union 7-13, LSD 7, 13-5-6w4, finished in the Bow Island sand at 3,226 ft., with good gas production. McColl-Union 7C-32 is drilling.

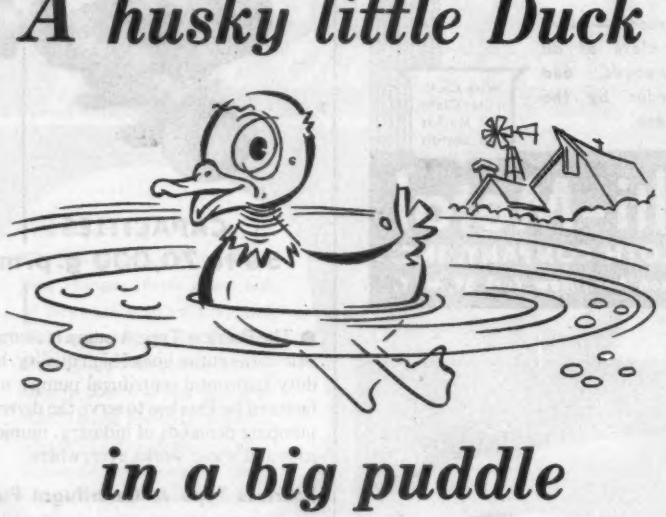
**Beaver Hill Lake.**—Beaverhill Lake 2, LSD 11, 11-50-17w4, drilled by Anglo-Canadian Oils and associated companies, is below 5,051 ft. with no porosity reported after 2,000 ft. in the limestone.

**Lloydminster.**—One completion is reported in the Alberta section; Athlone 1, NW 5, 11-50-2w4, testing oil sand at 2,008-16 ft. In the Saskatchewan section Crest 2, NE 77, 25-48-28w3, is testing with sand at 1,901-10 ft. East & West 1, SW 15, 25-48-28w3, finished at 1,888 ft. with sand at 1,879 ft. and is testing. Loptson 1, SE 2, 14-49-28w3, to the north end of the field, has been abandoned at 1,933 ft. Another north end well, Withers-Groat 9, SW 12, 11-49-28w3, finished at 1,873 ft. with oil sand at 1,853 ft. and is testing. To the extreme south and east, Lone Rock 1, SW 14-6-47-26w3, finished high at 1,786 ft. with Sparky sand at 1,781 ft. and is testing.

**Antelope Hills.**—A definite production test is starting in the Antelope Hills area close to the Saskatchewan boundary, where Alliance 1, LSD 15, 19-20-1w4, is shutting off water preparatory to testing porous zone at 3,785-3,810 ft. The Alliance 2 is drilling.

**British Columbia.**—In the Flathead Valley, southeast British Columbia, Canadian-Kootenay 1, deep test, is below 3,300 ft. in hard formation with traces of oil and no water. This test was resumed last May at 3,040 ft.


# A husky little Duck



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# PERMIAN BASIN

## Three Bar Devonian Extended Northeast

MIDLAND.—A northeast extension to production in Three Bar Devonian field of southwestern Andrews County, was reported last week. Stanolind Oil & Gas Co. 1-AD University made completion potential of 337 bbl. of 42°-gravity oil a day, through 16/64-in. tubing choke, with a gas-oil ration of 1,538:1. Top of the pay was 8,084 ft., drilled out to 8,167 ft. and plugged back to 8,151 ft. Acid treatment of 5,000 gal. was used.

Dollar Hide field, southwestern corner of Andrews County, received an offset producer to the Silurian discovery. Union Oil Co. of California 3 E. P. Cowden et al topped the pay at 8,482 ft., and a drill-stem test at 8,470-8,530 ft., open 3 hours and 10 minutes, recovered 50 bbl. of clean oil. Gas came to the surface in 10 minutes, mud in 37 minutes, and clean oil at the end of 44 minutes. It was allowed to flow into pits to clean itself for 41 minutes before being turned into tanks. It tanked the 50 bbl. of clean oil in 1 hour and 45 minutes. Casing was to be set to 8,465 ft. and completion made from open hole.

On the north side of Dollar Hide, Pure Oil Co. and Humble Oil & Refining Co. 1 Cowden was drilling ahead below 8,655 ft., in the Silurian, after a drill-stem test at 8,605-55 ft. gave no returns. Using a 1,000-ft. water blanket, there was no flow at the surface, and when drill pipe was broken down the recovery was 7,115 ft. of free oil, plus the water cushion. Top of the pay zone was placed at 8,493 ft. Operators planned to drill to around 8,690 ft. before making another test, and may carry it on down to around 10,000 ft. to test the Ellenburger.

New exploration work announced included: Humble 1 A. C. Pratt, an 8,000-ft. Ellenburger test 4 miles northwest of Loraine, in northeast Mitchell County. Operations are to start immediately. Union Oil Co. 1 A. A. Kuehn, 1½ miles southeast of Seminole, central Gaines County, will test through the San Andres, to around 5,500 ft. Twelve miles west of Seminole, Sun Oil Co. will drill a 7,200-ft. rotary test in Section 396, Block G, CCSD&RGNG Survey. Location is in an undeveloped area, but about half way between two recent discoveries. These are Cities Service Oil Co. 1 Riley, on the south, and Honolulu Oil Corp. 1 White & Shelton, on the northwest.

In north-central Howard County, about 7 miles northeast of Big Spring, A. M. Lacy will drill his 1 P. L. Buchanan to 3,600 ft. The proposed rotary test will be in Section 29, Block 31, of the TP Survey. Lario Oil & Gas Co. was scheduled to start operation immediately at its 1-B Mrs. Jessie Wallace, as an outpost test to Goldsmith field in northwest Ector County. The 4,200-ft. San Andres test is in Section 15, Block A, Public School Lands Survey.

### WEST TEXAS WILDCAT FAILURES

Ector County: Phillips Petroleum Co. 1-M Phillips-TXL, Sec. 13, Blk. 45, T&P Sur., 1 mi. W Goldsmith field, dry, TD 10,845 ft. in dolomite, San Andres 4,300 ft., Fullerton porosity 6,970 ft., Pennsylvanian 8,175 ft., Mississippian 8,250 ft., Woodford shale 8,445 ft., Devonian 8,685 ft., Ellenburger 10,805 ft., elevation 3,263 ft.

Pecos County: Ralph Lowe 1 Rosa M. Blakeslee, Sec. 16, Blk. 105, GC&SF Sur., ½ mi. S Heiner field, dry, TD 5,987 ft., Wolfcamp 5,300 ft., Ellenburger 5,790 ft., no shows, elevation 2,572 ft.

### SOUTHEASTERN NEW MEXICO

HOBBS.—Richfield Oil Corp.'s east Chaves County wildcat, 24 miles east of Roswell, in 6-12s-29e, was scheduled to test above the pre-Cambrian around 8,850-9,047 ft. Unconfirmed reports were that the section was in

the Ellenburger. Another deep Chaves County test by Richfield, the 1 Mullis Unit, 21-15s-29e, 20 miles east of Lake Arthur, was drilling below 11,729 ft. in black shale of unidentified age.

Humble Oil & Refining Co. 1 Greenwood, 9-22s-37e, east outpost test to the Brunson Ellenburger field of southeast Lea County, found the Ellenburger dry at 7,466-92 ft. and plugged back to test the lower Permian at 6,422-6,540 ft. At that depth the well was said to have flowed 25 bbl. of oil, plus 2,000,000 cu. ft. of gas a day, through 16/64-in. choke.

An extension test of the Cass area of southeastern Lea County, Continental Oil Co. 6-b-23 Skaggs, 23-20s-37e, was coring below 6,602 ft. in the lower Permian limestone. In the Monument-Eunice field, Amerada Petroleum Corp. 5 Phillips, 1-20s-36e, was drilling below 5,131 ft. It is to be carried to the Ellenburger and is regarded as a wildcat test.

# KANSAS

## Rooks County Wildcat Swabs 30 Bbl. Oil Per Hour

J. C. DOZIER et al 1 Hays, NE NE SE 28-9s-18w, Rooks County, swabbed 30 bbl. 31°-gravity oil per hour from Kansas City lime after treatment with 1,000 gal. of acid. The test, which is located 1 mile southeast of the Paradise pool, was drilled to 3,601 ft., or 15 ft. in the Arbuckle where hole filled with water. The hole was plugged back to 3,405 ft. and pipe was perforated at 3,405-13 ft., which is 83 to 91 ft. in the Kansas City.

Wilcox Oil & Gas Co. et al 1 Rush, NE NW NE 9-6s-22w, flowed 17 bbl. oil per hour through pipe perforations in Lansing at 3,655-65 ft. after treatment with 1,000 gal. acid. The test was drilled to 3,873 ft. which penetrated Arbuckle 52 ft. and was then plugged back to test Lansing in which a number of oil shows were logged.

Continental Oil Co. 1 Gilbert, NE NE SE 6-9s-18w, Rooks County, has pipe set at 3,489 ft., 2 ft. in the Arbuckle, to test oil show. Total depth is 3,491 ft. This test is about 1¼ miles northeast of the Southeast Barry pool.

Location for a rank wildcat has been made in Comanche County by Gulf Oil Corp. in SE SW 36-31s-20w, for its 1 Larimer, located about 10 miles southwest of the Alford gas pool and about the same distance northeast of the abandoned Morrison pool. The Alford gas pool produces from Mississippi lime at 5,039 ft. The Morrison pool produced from Viola lime at 6,467 ft.

Anderson-Prichard et al 1 Oldfather, SE SE NE 30-31s-14w, Barber County, is a 3,000-bbl. well in Maquoketa, topped at 4,622 ft. and extends the Skinner pool ¼ mile to the west.

Continental Oil Co. 3A Smith, NW SE NE 20-33s-12w, Barber County, is the first maximum well completion in the Boggs pool.

### KANSAS WILDCAT FAILURES

Barton County: Three-Way Drilling Co. 1 De Wald, SE NE NE 13-16s-15w, dry, TD 3,504 ft., anhydrite 940 ft., Lansing 3,152 ft., conglomerate 3,390 ft., Arbuckle 3,486 ft.

Butler County: Ralph Wixon 1 Adamson, SE SE NW 1-25s-4e, dry, TD 3,169 ft., Lansing 1,975 ft., Kansas City 2,195 ft., conglomerate 2,775 ft., Arbuckle 3,131 ft.

Ellsworth County: M. M. Price et al 1 Novotny, C S/2 SW NE 32-16s-10w, dry, TD 3,375 ft., anhydrite 648 ft., Lansing 2,996 ft., conglomerate 3,320 ft., Arbuckle 3,337 ft. with saturation from 3,369-75 ft.

Graham County: Nate Appleman 1 Hibbitts, SW SW SW 12-7s-21w, dry, TD 3,672 ft., anhydrite 1,760 ft., Topeka 3,416 ft., Heebner 3,340 ft., Lansing 3,363 ft., Sooy sand 3,614 ft., sandy conglomerate 3,618 ft., Regan sand 3,636 ft. with slight show of oil, quartz 3,669 ft.

Marion County: M. & L. Drilling Co. 1 Melcher, NE NE NE 12-19s-4e, dry, TD 2,998 ft., Mississippian 2,332 ft., Viola 2,992 ft., no shows.

McPherson County: Phillips Petroleum Co. 1 Holcomb, SE NE SW 28-17s-1w, dry, TD 3,330 ft., conglomerate 2,663 ft., Mississippi lime 2,666 ft. with a show of oil, Kinderhook 2,842 ft., Hunton 2,950 ft., Sylvan 3,035 ft., Viola 3,132 ft., cherty Viola 3,162 ft., crystalline Viola 3,190 ft., Simpson shale 3,239 ft., Simpson sand 3,256 ft., Arbuckle 3,296 ft. with good porosity.

H. A. Burt 1 Voth, SE NW NE 7-17s-1w, dry, TD 2,733 ft., Mississippian 2,688 ft., no shows.

Pawnee County: Kiowa Drilling 1 Russell, NE NE NE 10-23s-16w, dry, TD 4,188 ft., Heebner 3,498 ft., Lansing 3,621 ft., conglomerate 3,993 ft., Viola 4,070 ft., Simpson 4,078 ft., Arbuckle 4,129 ft.

Phillips County: Tom Palmer 1 Boethin, SW SE NW 12-4s-20w, dry, TD 3,646 ft., anhydrite 1,638 ft., Heebner 3,250 ft., Lansing 3,269 ft., Arbuckle 3,606 ft.

Saline County: H. H. Meyer 1 Stauffer, C N/2 NE NE 1-14s-2w, dry, TD 3,408 ft., Lansing 1,935 ft., Mississippian 2,580 ft., Hunton 2,980 ft., Viola 3,180 ft., Arbuckle 3,235 ft.

Sheridan County: Continental 1 Muir, SW NE SW 18-6s-26w, dry, no total depths or tops reported.

Stafford County: Three-Way Drilling Co. 1 Lamb, NE NE SE 20-23s-11w, dry, TD 3,850 ft., anhydrite 560 ft., Heebner 3,162 ft., Lansing 3,364 ft., Basal Kansas City 3,599 ft., conglomerate 3,690 ft.

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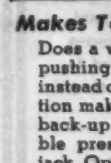

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cherty Viola 3,707 ft., Simpson 3,749 ft., Arbuckle 3,807 ft., no shows.

Thomas County: Texas Co. 1 Meeks, SE SE SW 36-8s-31w, dry, TD 4,942 ft., Dakota 1,490 ft., Permian 2,280 ft., Ft. Riley 3,006 ft., Heebner 3,969 ft., Leavenworth 3,994 ft., Synderville 4,012 ft., Lansing 4,026 ft., Mississippian 4,490 ft., conglomerate 4,661 ft., Arbuckle 4,852 ft.

# ROCKY MOUNTAIN

## Stanolind Seeking to Kill Beaver Creek Blowout

DENVER.—Stanolind Oil & Gas Co. No. 8 Unit, C NW SE 9-33n-96w, Beaver Creek gas field, Fremont County, Wyoming, an outpost on the west side which will extend the field ¾ mile, is still trying to kill the well after a second blowout at present depth of 8,670 ft. in the past 3 weeks.

It had the top of the Morrison at 8,664 ft., and set the 7-in. at 8,595 ft. The Lakota sand, in which the other wells in the field, with one exception, were completed, was topped at 8,592 ft. A test of the Lakota, open 1½ hours, showed 7,000,000 cu. ft. of gas per day. While attempting to pull the packer, set at 8,515 ft., the well blew out. It was killed, and then while pulling the tubing it blew out the second time 2 weeks ago.

**East Utopia wildcat resumed.**—Texas Co. 2 Nick Lass, NW NE SW 14-33n-4e, East Utopia district, Liberty County, Montana, which shut down last November for the winter when it was showing for a discovery in the Jefferson lime of Devonian age, has resumed operations. It had the top of the Devonian at 3,329 ft., and picked up Jefferson dolomite at 3,559 ft., the formation showing excellent porosity at 3,562-72 ft., followed by more dolomite with spotted porosity and fairly live oil. A drill-stem test at 3,563-91 ft., open 25 minutes, showed an estimated recovery of 20,000,000 cu. ft. of sweet gas. After drilling to 4,593 ft., it set retainer at 2,202 ft., and squeezed, and then shut down for the winter. It is now drilling out retainer and preparing to test.

**Madison lime wells.**—Two key wells in the Madison lime area of the Cut Bank field are near completions with both having shows of oil. Texas Co. 1 Doorenbos, C NE SE 25-36n-6w, 2 miles northwest of the nearest Madison producer in the south pool, and a mile south of the nearest in the middle pool, had the top of the Madison at 3,158 ft. with a show of oil at 3,161 ft., and is preparing to make an electric survey of the hole at 3,234 ft., total depth. Union Oil Co. 2 McNamar unit, C SW SW 14-36n-5w, 5 miles northeast of the Doorenbos well, had an oil show in the lime at 2,915 ft., after killing a flow of 17,000,000 cu. ft. of gas in an upper horizon, and is preparing to test.

**Barker Creek test.**—Southern Union Production Co. 9,000-ft. test to the Lower Pennsylvanian in C NW 3-32n-14w, Montezuma County, Colorado, an extension of Barker Creek gas field, San Juan County, New Mexico, will not be drilled at present as rig is being moved into the Monticello District, San Juan County, Utah, for a deep well in that area.

**Church Buttes.**—Mountain Fuel Supply Co. 2 Unit, NE NE NE 22-17n-112w, Church Buttes structure, Sweetwater County, Wyoming, after mixing oil-base mud and conditioning hole, is testing at 12,692 ft. Location is 5 miles northeast of discovery. Company has released no information, but unofficial reports say that it showed for 50,000,000 cu. ft. of gas in drill-stem test several weeks ago. Same company's 3 Unit, NE SW NE 12-16n-113, Uinta County, 1½ miles west of the discovery, is still fishing at 12,960 ft.

**Clay Basin deep test.**—Mountain Fuel Supply Co. 6-W Murphy, NW SE NW 22-3n-24e, a Weber sand test in the Clay Basin gas field, Daggett County, Utah, stopped drilling at 9,355 ft., plugged back to 5,875 ft., set retainer at 5,475 ft., and is testing. Unofficial reports say it tested several hundred feet of the Weber with unfavorable results and will complete in the Dakota.

**Northwest Elk Basin.**—Sinclair-Wyoming Oil Co. 1 Wilkins, NW SW NW 28-9s-23e, Northwest Elk Basin, Carbon County, Montana, which showed gas and distillate in the Tensleep, and oil and gas in upper horizons, will continue to the Madison, which is estimated to be 800 ft. thick at this location. It is coring at 6,340 ft. Top of the Tensleep was at 5,912 ft., and Amsden, 6,048 ft.

**New operations.**—Nineteen new operations were reported, of which four were in Rangely field, Colorado; nine in Wyoming, and six in Montana. Only new wildcat was Paint Rock Development Co. 1 McDonald-Government, C NE NE 32-49n-90w, Paint Rock structure, Big Horn County, Wyoming.

# APPALACHIAN FIELD

## Hancock County Wildcat Tops Corniferous Lime

PITTSBURGH.—In Clay district, Hancock County, West Virginia, George W. Dawson is drilling a wildcat on Wayne Dornan farm which topped the Corniferous lime at 4,530 ft. which from a surface elevation of 1,042 ft. places it at —3,488 ft. It is located about 1,500 ft. S-10-W of the Oriskany gas well on the Ramsey farm and appears about 32 ft. lower on structure. Casing has been run, and drilling resumed.

In Greenbrier County, the rotary wildcat of The Texas Co. on G. R. Dean tract in Williamsburg district is shut down for a

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1 Fractionating tower Alco Products Co. design. 5' 0" dia. x 93' 6" high 42 fractionating trays equipped with Alco pressed steel bubble caps. Ladder full length with platform each manway. 8" vapor line and 2" reflux line, tower insulated, rock wool and insulating cement with Thermocoat cover.

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drill-stem test at 8,120 ft. or 132 ft. below the top of the Clinton sand.

In Logan district, Logan County, Columbian Carbon Co. completed a good Big Lime gas well in 921 Island Creek Coal Co. with the Big Lime topped at 1,690 ft.; first gas 1,838 ft., and a total of 4,091,000 cu. ft. at 1,898 ft. where it was bottomed.

New locations totaled 24. They were in Elk district, Barbour County; Otter district, Braxton County; Buffalo district, Clay County; Grant district, Doddridge County; DeKalb district, Gilmer County; Ripley district, Jackson County; Cabin Creek and Poca districts, Kanawha County; Laurel Hill district, Lincoln County; Chapmansville and Logan districts, Logan County; North Fork district, McDowell County; Harvey and Kermit districts, Mingo County; Teays Valley district, Putnam County; Marsh Fork and Trap Hill districts, Raleigh County, and Grant district, Ritchie County.

**Southwest Pennsylvania.** — Elevations for some of the wildcats starting on Chestnut Ridge in Fayette County are as follows: Peoples Natural Gas Co. 1 Alice May Martin, Springhill Township, 2,367 ft.; Manufacturers Light & Heat Co. 8 Barton, Georges Township, 2,314 ft., derrick floor; New Penn Development Corp. et al 1 Paul E. Dunham, Springhill Township, 2,320 ft., derrick floor; Orville Eberly et al 1 Albert Opperman, Georges Township 2,358 ft.

### WEST VIRGINIA WILDCAT FAILURES

Jackson County, Ripley district: Hope Natural Gas Co. 9,107 Harry Riley, TD 4,910 ft., Corniferous lime 4,770 ft., Oriskany 4,878-4,909 ft.

Kanawha County, Elk district: Columbian Carbon Co. 937 W. S. Newhouse, TD 5,380 ft., elevation 937 ft., Corniferous lime 5,169 ft., Oriskany 5,293-5,363 ft., gas (15,000 cu. ft.) 5,306 ft., shot 5,300-40 ft., after shot 47,000 cu. ft., plugged.


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Fig. 247
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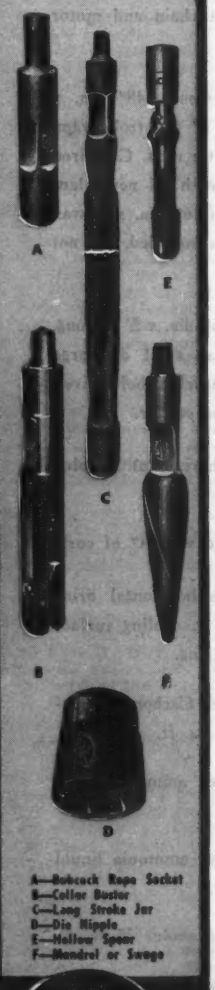


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# OKLAHOMA

## Northeast Lindsay Testing Third Producing Horizon

CARTER OIL CO. 1 Harrison, SW NE 25-5n-4w, McClain County, is running test in Deese. If found productive, it will give the Northeast Lindsay pool its third producing horizon. The discovery well ¾ mile west in NW SE 26-4n-3w, produces from Hunton, and ¼ mile southeast of the Carter 1 Harrison, the Carlock 1 Harrison produces from the Bromide.

Sinclair Prairie Oil Co. 1 McDaniel, SE SE 35-5n-4w, McClain County, which extends the East Lindsay pool 1 mile west and ¼ mile north, flowed 570 bbl. oil in 18 hours through 5/16-in. choke with 3,200,000 cu. ft. of gas per day.

Carter Oil Co. 1 Nichols, NW NW SW 14-2n-2w, Garvin County, the most westerly well in the Elmore Northeast pool, which is still confined to section 14, flowed 316 bbl. 41°-gravity oil in 24 hours from Gibson pay zones at 6,522-40 ft. and 6,554-59 ft. Carter 2 Bohanan, NW SW NE section 14, ¼ mile northeast of the discovery well, missed the Gibson sand, is is shut down after developing fishing job at 8,134 ft. in Bromide.

Magnolia Petroleum Co. 1 Lacy, SE NW 5-4n-3w, Garvin County, located 1¼ miles east of production in East Lindsay pool, flowed 3,000,000 cu. ft. per day and 60 bbl. water per hour for 4 hours before going dead, from perforations at 10,135-150 ft. and 10,100-15 ft.

On the southeast side of the Southwest Antioch pool, Globe 1 Evans, NE NE SW 32-3n-2w, flowed 53 bbl. oil per hour for 7 hours through ¾-in. choke. Total depth is 6,766 ft. in Hunton. Gibson sand was logged at 6,566-96 ft. This is the 54th producer in the pool.

Stanolind Oil & Gas Co. 1 Simms, NE NE SE 2-1s-4w, Stephens County, has pipe set on bottom at 6,759 ft. Detailed information regarding oil shows is not available.

Reports on state's deeper tests show present status of wells as follows: Shell 1 Walters, Beckham County, drilling below 12,810 ft. after setting whip-stock and successfully drilling by stuck drill pipe; Superior 51-11 Weller, Caddo County, is testing up the hole after setting depth record at 17,823 ft.; Magnolia 1 Winter, Dewey County, is drilling below 12,721 ft.; Stanolind 1 Briscoe, Grady County, is drilling below 12,336 ft.; and Gulf 1 Ida, Grady County, is drilling below 12,152 ft.

### OKLAHOMA SUCCESSFUL WILDCAT

Noble County: Derby Oil & Republic Natural Gas Co. 1 Weigle, NE NE SE 2-21n-2w, flowed 853 bbl. of 41.6°-gravity oil per day from second Wilcox at 5,133-39 ft. through ½-in. choke, Pawhuska 2,270 ft., Elgin 2,372 ft., Hoover 2,645 ft., Oread 2,750 ft., Tonkawa 3,130 ft., Avant 3,420 ft., Layton 3,750 ft., Big lime 4,242 ft., Oswego 4,345 ft., Mississippian 4,827 ft., Woodford 4,952 ft., Misener 4,998 ft., Viola 5,002 ft., dolomite 5,047 ft., first Wilcox 5,081 ft., dolomite 5,100 ft., TD 5,139 ft.

### OKLAHOMA WILDCAT FAILURES

Alfalfa County: Tom Ray et al 1 Fannie Pelter, C NE SE 21-25n-12w, dry, TD 7,238 ft., anhydrite 1,650 ft., Pawhuska 3,590-3,858 ft., sand 4,320-70 ft. and 4,525 ft., Avant-Dewey 4,610-70 ft., Lower Tonkawa 4,923-5,060 ft., Layton sand 5,305-90 ft., Checkerboard 5,410-20 ft., Oswego 5,620-5,750 ft.

Hughes County: Mid-Continent Petroleum Corp. 1 Badger, SW SW SW 1-6n-8e, dry, TD 3,840 ft., brown lime 2,587 ft., first Booch 2,750-58 ft., second Booch 2,830 ft.,

Gilcrease 3,070 ft., Union Valley 3,657 ft., first Cromwell 3,684-3,731 ft., second Cromwell 3,740-81 ft.

Pottawatomie County: Danciger Oil & Refining Co. 1 A. T. Ailey, SW SW NE 2-10n-4e, dry, TD 4,891 ft., Avant 2,120 ft., Hogshooter 2,605 ft., Layton 2,680 ft., Checkerboard 2,950 ft., Oswego 3,645 ft., Prue 3,740-70 ft., Bartlesville 4,210-65 ft., Mayes 4,327-4,515 ft., Woodford 4,515-82 ft., no Hunton present, Synvan 4,630-4,710 ft., Viola 4,710-60 ft., Simpson dense 4,760-72 ft., Simpson dolomite 4,772-92 ft. with a show of oil, Wilcox 4,792-4,858 ft.

Seminole County: A. Ben Caldwell 1-A Harjoche Kaney, SE SW NW 19-8n-7e, dry, TD 3,350 ft., Lower Calvin 2,245-2,310 ft. with a show of oil, Henryetta coal 2,465 ft., Senora lime 2,500 ft., brown lime 3,200 ft., Booch 3,285-96 ft., Cromwell 3,327-33 ft., shale 3,334-43 ft., Lower Cromwell 3,343-50 ft.

# OHIO, KENTUCKY

## Muskingum County Test Gages 2,030,000 Cu. Ft.

COLUMBUS.—John Morrow et al brought in a good gas well on a semiwildcat location on P. R. Seyerls, Section 19, Brush Creek Township, Muskingum County. The Clinton sand was topped at 4,090 ft. and drilled 22 ft. in to a total depth of 4,112 ft. where the well gaged 2,030,000 cu. ft. natural.

Ohio Oil Co.'s test in Logan County reached the granite at 3,320 ft., a much shallower depth than expected. The drill penetrated 40 ft. of granite wash and then 41 ft. into the granite to a total depth of 3,361 ft. The test was located on the John Harrod farm in McArthur Township.

Ohio Fuel drilled in a 798,000-cu. ft. well along the west side of the Sayre pool in Bearfield Township, Perry County, on Scott Higgins in Section 15. The Medina sand was drilled only 5 ft. in to a total depth of 3,899 ft.

### OHIO WILDCAT FAILURE

Morgan County, Deerfield Township: Brendel Oil & Gas 1 Maynard Barnes, Sec. 12, Trenton 5,720-6,464 ft., St. Peter 6,600 ft., TD 6,644 ft.

### INDIANA

EVANSVILLE.—Ralph Halbert et al 1 Ayrshire Collieries, SW SE SW 30-2s-7w, Pike County, was completed for initial production of 60 bbl., pinched in. The well on open flow would make considerably more oil. Production is from McClosky at 1,403-07 wt. Total depth is 1,409 ft. This well opens a new area which has been designated the Coe pool.

### INDIANA SUCCESSFUL WILDCATS

Pike County: Ralph Halbert et al 1 Ayrshire Collieries, SW SE SW 30-2s-7w, IP 60 bbl., pinched, from McClosky 1,403-07 ft., TD 1,409 ft., discovery well Coe pool.

Hoosier Pipe Line 1 Walker, NE SE SW 22-1n-9w, Aux Vases 1,501-13 ft., shot 30 qt., IP 71 bbl., new pay zone.

### EASTERN KENTUCKY

ASHLAND.—Several new locations were noted in the Eastern Kentucky field of operations during the week, with no completions on record for the period.

Kentucky-West Virginia Gas Co. reported location of No. 5755 on the Joseph Stewart property, Knott; No. 870, Roland Jackson, Magoffin, and No. 5746, M. B. Goble, Martin.

### WESTERN KENTUCKY

OWENSBORO.—There were 18 completions during the past week, 7 of which were producing oil wells. First reports include 3 wildcats and 20 field operations. Two of the wildcats are in Henderson County, and one is in Ohio County.

# ILLINOIS

## McClosky Lime Discovery 12 Miles East of Salem Pool

MATTOON.—Gilliam Drilling Co. et al 1 Bertha Ebe, NE NE NW 14-2n-4e, Marion County, on drill-stem test at 2,754-64 ft. in McClosky lime, had gas at surface in 11 minutes and flowed oil in 1 hour and 40 minutes. Pipe is being set to test. The prospective well is about 12 miles east of the Salem pool. Cypress was logged at 2,445 ft., Benoist at 2,661 ft., Ste. Genevieve at 2,719 ft., and Rosiclare at 2,727 ft.

Ben Taylor has set pipe at 1,921 ft. in 1 H. J. Sebastian, NW NE SW 21-1n-2e, Marion County, to test Benoist at 1,921-27 ft. Drill-stem test recovered 180 ft. of oil-cut mud.

Tulley and Carter 1 W. C. Hubble, NE SW SW 17-1s-8e, Wayne County, is testing O'Hara limestone at 3,194-3,204 ft. Drill-stem test at 3,188-3,203 ft. recovered gas in 5 minutes, and 2,670 ft. oil, free of water. This is a new pay for the Mt. Erie South area.

### ILLINOIS SUCCESSFUL WILDCATS

Edwards County: William Bill 1 Fieber, NE SE NE 31-2s-14w, IP 42 bbl., TD 3,232 ft., PB 3,190 ft., perf. 3,168-77 ft. in McClosky, perf. 3,177-34 ft. in Rosiclare, 2,000 gal. acid at 3,168-77 ft.

Wayne County: Robinson and Puckett, SE NW SW 17-1s-8e, IP 110 bbl., TD 3,125 ft., Lower Renault 3,106 ft., Aux Vases 3,113-25 ft., shot 30 qt. at 3,122-35 ft.

### ILLINOIS WILDCAT FAILURES

Clay County: J. W. Rudy 1 McElyea, SE SE NE 1-3n-5e, dry at 3,010 ft., Menard 2,144


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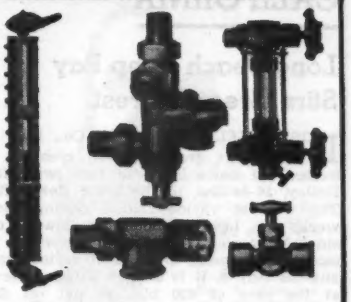
QUALITY PRODUCTS



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ft., Cypress 2,539 ft., Aux Vases 2,782 ft., McClosky 2,891 ft.

Clark County: F. Heffler 1A Cartwright, SE NW SE 35-12n-14w, dry at 500 ft.

Douglas County: Burkett and Farnham 1 Brock, SE SE NE 7-15n-14w, dry at 859 ft.

(Continued on page 145)

# CALIFORNIA

## Long Beach Deep Pay Stirs Great Interest

LOS ANGELES.—Shell Oil Co., Inc., last week was credited with creating the hottest oil news in some time with its 2 Dolley, 29-4s-12w, in the Long Beach field. The well at various times during recent weeks has been reported as flowing considerable amounts of oil. Last week it was said to be flowing to tanks at various rates, and on July 8, it is alleged to have flowed at the rate of 650 bbl. of net oil daily through a 16/64-in. choke. The crude was of 32.7° gravity, and contained a 25 per cent water cut. Pressures were gaged at 850 psi. on tubing and 2,700 psi. on casing, and the oil flow was accompanied by gas at the rate of 1,500,000 cu. ft. per day. The well has been killed and operators currently are pulling tubing preparatory to running liner.

Although Shell has disclosed no information concerning the well, it is said to have gone through a fault on the way to the bottom at 10,544 ft. It may have found an equivalent of the deep De Soto zone which was discovered several years ago. The De Soto zone lies entirely in the Miocene and so far has been exploited only in one well, the discovery, which indicated the possibilities of deep production which may extend to 15,000 ft. in depth. If the 2 Dolley has confirmed this belief, it is possible that a very active drilling campaign could result. At any rate, companies for weeks have been buying up the deep rights in the vicinity of Shell's well and, according to reports, nothing can be had in the immediate vicinity. It is also known that some companies are seeking deep rights at a distance as far as ½ mile from Shell's apparent discovery.

The East Los Angeles field, of Los Angeles County, last week yielded another substantial producer at the Richfield Oil Corp. 2 Edison, 16-2s-12w. Richfield swabbed the well in for an initial flow of 494 bbl. daily of 37.7°-gravity oil through a 20/64-in. choke. Water cut was estimated at 20 per cent and gas flow was gaged at 2,190,000 cu. ft. daily. The well, drilled to a total depth of 8,837 ft., was completed flowing through liner perforated at 8,574-8,835 ft. On the basis of results obtained at the 2 Edison, Richfield is preparing to spud in the 3 Vail, a south offset. Farther to the north, the company is drilling ahead at 3,175 ft. at the 1 North Side, which is located outside proved territory.

Sunray Oil Corp. has announced plans to start development operations on the Carega Ranch, which adjoins the northwesterly portion of the Los Flores Ranch, on which this company recently completed a new discovery, the 1 Los Flores, 4-8n-33w. The Carega Ranch originally was explored by the Apache Oil Co. some 10 or 12 years ago.

Crestmont Oil Co. has announced their intention to drill several wells on the old Hope Oil Co. property in the Kern River area. Their first venture will be known as the 2 Gray, located in 8-29s-29e.

Richfield Oil Corp. has staked location for the 1 Del Cielo in 30-2n-22w, in the Montalvo area of Ventura County, an area which recently came to life as the result of a discovery by the Standard Oil Co. of California. Richfield's test is located approximately 1 mile north of Standard 65-3 McGrath, offset to the discovery well, which currently is preparing to test at a depth of 8,910 ft.

**CALIFORNIA SUCCESSFUL WILDCATS**

Kern County, Cymric area: Independent Exploration Co. 11 Cymric, 21-29s-21e, flowed 1,080 bbl. per day through 20/64-in. choke, gravity 38.2°, 0.4 per cent cut, 30 ft. of perf. liner landed at 4,915 ft., TD 4,923 ft.

Los Angeles County, East Los Angeles area: Richfield Oil Corp. 2 Edison, 16-2s-12w, flowed 424 bbl. per day through 20/64-in. choke, gravity 36.2°, 20.0 per cent cut, perf. liner 8,574-8,835 ft., TD 8,837 ft.

Orange County, West Newport area: California Exploration Co. 1 Cagney, 28-6s-10w, pumped 124 bbl. per day, estimated gravity 8-10°, no water, TD 2,511 ft.

Ventura County, West Mountain area: D. D. Feldman 4 Richardson Estate, 23-3n-21w, pumped 70 bbl. in 11 hours, 22.6° gravity, 12.0 per cent cut, perf. 2,696-4,140 ft., 4,183-4,525 ft., 4,568-4,741 ft., TD 4,747 ft.

**CALIFORNIA WILDCAT FAILURES**

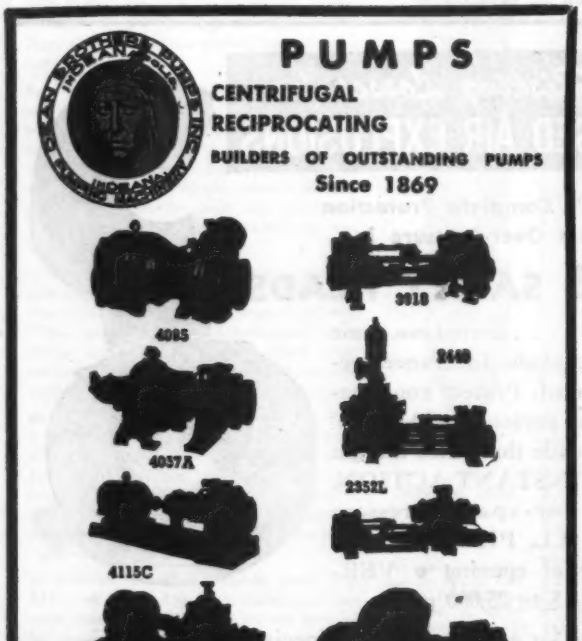
Fresno County, Coalinga area: Robert S. Lytle, Operator, No. 58-34, 34-20s-15e, dry, elev. 647 ft., TD 8,827 ft.

Riverdale area: Pacific Western Oil Corp. 1 Enmark, 5-17s-19e, dry, elev. 222 ft., Kreyenhagen 7,608 ft., Eocene 7,910 ft., TD 8,100 ft.

Kern County, Premier area: Independent Exploration Co. 81 Kuhn, 15-27s-26e, dry in schist, elev. 552 ft., weathered schist 7,680 ft., hard schist 7,684 ft., TD 7,737 ft.

Solano County, Winters area: Shell Oil Co., Inc. 1 Szekers, 19-8n-1e, dry, elev. 114 ft., TD 5,118 ft.

Ventura County, Snowball Mountain area: M. T. Grubb, Operator 1 Snowball, 19-4n-24w, dry, elev. 140 ft., TD 6,416 ft.

# Among the Drilling Contractors

## Two $100,000 Oklahoma Drilling Firms Chartered

**Decem Drilling Co., Inc.,** Oklahoma City, and **Loftis Drilling Co., Inc.,** Seminole, both with a $100,000 capitalization, have recently been issued charters by the Oklahoma secretary of state.

Incorporators of the Oklahoma City firm are Ted R. Warkentin and A. J. Warkentin, Oklahoma City, and Lawton Burton, Lawton. Loftis Drilling Co. was formed by M. P. Loftis, T. E. Capp, and Mary Loftis, all the Seminole.

*Active rotary drilling rigs in the United States hit a peacetime high of 1,873 in June . . . see story on page 42 of News Developments.*

**Virginia Drilling Co., Inc.,** Wichita, and Ed Adair are completing 1 Wolf, SW SW SW 11-21-12, a wildcat in Stafford County, Kansas. The well flowed 1 bbl. per hour and is being cleaned out. Virginia Drilling has also completed its 3 Mueller "A," CNL NW SE 29-21-12, in the same county for a pump potential of 153 bbl. per day.

**Wayne Drilling Co.,** Carmi, has completed its 2 Thompson, NE 27-2n-7e, Wayne County, Illinois, for 35 bbl. of oil and 60 bbl. of water.

**H. M. Williams Drilling Co.,** Wichita, is rigging up for the Alpine Oil & Refining Co. 1 Eshom, SE SW SW 35-22-3w, Harvey County, Kansas.

**Williams-Copeland, Inc.,** Tulsa, is starting the Ohio Oil Co. 1 Yarbrough & Allen, W. Shelton Survey A-2011, northeastern Cottle County, Texas.

**McVay & Stafford Drilling Co.,** Tulsa, is starting a 6,700-ft. test, the Mid-Continent Petroleum Corp. 2

*Shown here are supervisory personnel interested in Sun Oil Co. 2 Fred Jamison in Coke County, Texas. The men are L. A. Tibbits, tool pusher, Baker & Taylor Drilling Co.; Walter Tucker, tool pusher, Ray-Harris Drilling Co.; A. Hill, tool pusher, Roberts & Hawkins; and J. T. Hightower, production foreman; G. E. Sweeney, superintendent, and J. C. Spalding, mud engineer, all of Sun Oil Co.*

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Reeves, NW NW 29-20s-37e, 5 miles south of Monument and 7 miles northwest of Drinkard pool, Lea County, New Mexico.

**Claude Wentworth Drilling Co.,** Tulsa, has contracted for a Skelly Oil Co. wildcat, the 1 Alexander, SE SE SW 6-33-12, Barber County, Kansas.

**Hugh B. Hodges,** Tulsa, is the contractor for the Magnolia Petroleum Co. 5. McGeorge, Block 72, Fannin Survey, Walnut Bend area, Cooke County, Texas.

**Clyde C. Hall Drilling Co.,** Bakersfield, is the contractor for Independent Exploration Co. 1 Kuhn, a wildcat northwest of Premier field, Kern County, California.

**Herndon Drilling Co.,** Lyons, Kans., is the contractor for a Stanolind Oil & Gas Co. wildcat, the 1 L. C. Repp, NE NE NW 29-28-17, Kiowa County, Kansas.

**Cook Drilling Co.,** Fort Worth, has brought in a producer in Vaughn-Pickens field, its 1 Anderson, 11-11n-3e, Madison County, Mississippi. The well pumped 138 bbl. in 24 hours from total depth of 4,869 ft.

**Charlie Grace,** Wichita Falls, is drilling his 1 Koeninger, a wildcat in Block 13, J. J. Gholson Survey, southeast of Risch field, Jack County, North Texas.

**Bennett & Roberts** are drilling a wildcat, their 1 Henrie, NE NE SE 2-10-19, 1¼ miles north of Vohs pool, Rooks County, Kansas.

**Commonwealth Drilling Co.,** Calgary, Alta., is working on Highwood-Dina 1, SE 9, 12-45-1w4, in a potential southwest extension of the Lloydminster field.

**Harbar Drilling Co.,** Wichita, swabbed 180 bbl. of oil per day in the J. M. Huber 1 Baugher "A," SE SE NW 23-12-21, Trego County, Kansas.

**T. J. Conway,** Jackson, has hit a producer in Langsdale field, Clarke County, Mississippi. His 5 Pippen, NW 29-1n-18e, pumped 75 bbl. per day from Eutaw sand between 3,722 and 3,809 ft.

**General Petroleums,** Calgary, Alta., are finishing Lone Rock 2, SW 13, 6-47-26w3, in the southeast portion of the Lloydminster field, part of a five-well program for this area.

**Meredith, Clegg & Hunt,** Houston, having completed 1 Warschak Unit as a gas-condensate producer for Sinclair Prairie Oil Co. in Colorado County, Texas, are moving to the 1 Heinsohn Unit in the same area near Frelsburg. Contract depth 10,000 ft.

**Mac Drilling Co.,** Houston, has recompleted its 1 Cynthia Payne, Vital Flores Survey, Abstract 14, discovery well of Evergreen pool, San Jacinto County, Texas. After reworking, the well flowed a Railroad Commission potential of 126 bbl. of 42.6° A.P.I. gravity oil through a 12/64-in. choke.

**Earl Wakefield,** Wichita, is the contractor for a wildcat, the George F. Johnston et al 1 Lappin, NW SW SW 11-5-20, 1 mile southeast of Logan and 1 mile north of Hansen pool, Pawnee County, Kansas.

**Spartan Drilling Co.,** Dallas, and Barnsdall Oil Co. are preparing to drill 1 Bodcaw Oil, a wildcat in C SE SW 8-18s-23w, south of McKamie field, Lafayette County, Arkansas.

**Delta Drilling Co.,** Tyler, Tex., and Al Brown, Kilgore, Tex., have a 2,000-acre farmout from Sun Oil Co. in Arabella area, Hopkins County, Texas, and are to drill a Paluxy zone test. Acreage is located in Starr, Jones, Lee, and Kneeland surveys.

**Russell & Beckham,** McCamey, Tex., are moving in tools for Ted Weiner

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Standco Brake Lining Co.
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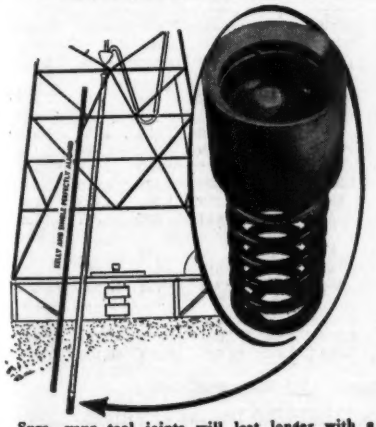

Sure, your tool joints will last longer with a "Joint Aid" in the mouse-hole . . . Kelly and single are spun up easily and quickly . . . in perfect alignment . . . *galling due to misaligned joints is completely eliminated.* You save time . . . you save wear and tear on tool joint threads . . . *you'll save the cost of a "Joint Aid" on the prevention of one galled tool joint.*

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HOUSTON, TEXAS


et al 1 University-McMillan, a wildcat in NE Section 23, Block 30, University Lands, 2 miles northeast of McElroy pool, Crane County, West Texas. Contract is for 3,700 ft.

**Hewgley Drilling Co.**, Jackson, Miss., has the contract for a wildcat, the Amerada Petroleum Co. 1 State, C NW NE 16-18n-2e, 1 mile west of Eagle Bend, Warren County Mississippi.

**Mallard Drilling Co.** and Ray Fleming are planning to drill 1 Ross, SE SE NE 11-5-20, 1½ miles northeast of Hansen pool, Pawnee County, Kansas.

**L & S Drilling Co.**, Tyler, has contracted for the W. H. Oberthier 1 Mordica Brown estate, SE SE SW 26-15s-24w, 2½ miles south of the Midway field, Lafayette County, Arkansas. Contract is for the Rodessa zone.

**Glasscock Drilling Co.**, Shreveport, has contract for a Miller County, Arkansas, wildcat, the Big Chief Drilling et al 1 Froid, NW SE NW 26-17s-27w, 3 miles west of Fouke. Contract is for 6,000 ft.

**Mohawk Drilling Co.**, Oklahoma City, has the contract for a Owenwood Pool No. 3 wildcat in Section 28, Comanche Indian Reserve, 11 miles southwest of Throckmorton, Throckmorton County, North Texas.

**Jackson Drilling Corp.**, Tulsa, is drilling a wildcat, the Westgate-Greenland Oil Co. 1 Bartos, SE SE SE 15-9-19, 2 miles south of Barry pool, Rooks County, Kansas. Cities Service Oil Co. and Phillips Petroleum Co. are supporting the test. Jackson is drilling another wildcat for the same company in McPherson County, the 1 Voth, SE NW NE 7-17-1.

**LEGAL**

Sealed bids will be received by the Director of Public Service-Safety of the City of Lancaster, State of Ohio, at the office of said Director until twelve o'clock noon of the 31st day of July, 1947, for the sale of the following:

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Each bid must contain the full name of every person or company interested in the same and be accompanied by a bond in the sum of $100.00 to the satisfaction of the Director or a certified check on some solvent bank as a guarantee if the bid is accepted. Should any bid be rejected such check will be forthwith returned to the bidder, and should any bid be accepted such check will be returned upon the execution of sale.

The right is reserved to reject any and all bids.

By order of the Director of Service-Safety.

D. L. GROVE,
Director of Public Service-Safety.


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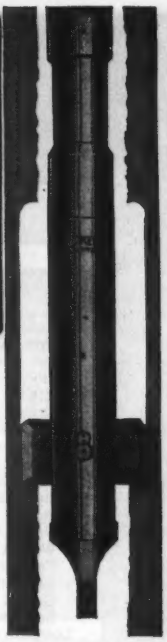

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## WEEKLY WELL COMPLETIONS . . . WEEK ENDED JULY 12, 1947

| | Total of all wells | | | | | Cum. | | Wildcat completions and discoveries | | | | | Cumulative total, 1947 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Comp. | Oil | Gas | Dry | Footage | 1947 | 1946 | Oil | Dist. | Gas | Dry | Total | Oil | Dist. | Gas | Dry | Total |
| New York | 38 | 19 | 0 | *19 | 50,084 | 767 | 836 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 2 | 5 |
| Pennsylvania | 61 | 35 | 2 | †24 | 89,569 | 1,462 | 2,129 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| West Virginia | 20 | 1 | 11 | 8 | 61,161 | 422 | 373 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| Ohio | 25 | 6 | 11 | 8 | 73,400 | 666 | 620 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 3 | 27 | 30 |
| Indiana | 17 | 5 | 0 | 12 | 28,364 | 317 | 180 | 2 | 0 | 0 | 0 | 2 | 10 | 0 | 0 | 24 | 34 |
| Kentucky | 23 | 10 | 0 | 13 | 32,066 | 327 | 248 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 25 | 31 |
| Illinois | 49 | 30 | 0 | 19 | 135,215 | 1,006 | 1,148 | 2 | 0 | 0 | 15 | 17 | 36 | 0 | 1 | 178 | 215 |
| Michigan | 15 | 4 | 4 | 7 | 27,244 | 394 | 421 | 0 | 0 | 0 | 1 | 1 | 5 | 0 | 8 | 106 | 119 |
| Kansas | 65 | 36 | 7 | 22 | 213,332 | 1,311 | 1,040 | 0 | 0 | 0 | 13 | 13 | 19 | 0 | 10 | 171 | 200 |
| Neb., Mo., Iowa | 0 | 0 | 0 | 0 | 0 | 2 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 |
| Oklahoma | 43 | 19 | 12 | 12 | 156,637 | 2,085 | 1,278 | 1 | 0 | 0 | 1 | 2 | 45 | 3 | 6 | 347 | 401 |
| Texas | 195 | 120 | 9 | 66 | 833,598 | 4,540 | 4,240 | 4 | 0 | 1 | 30 | 35 | 153 | 27 | 47 | 682 | 909 |
| North Central (Dist. 7-b & 9) | 75 | 39 | 1 | 35 | 186,488 | 1,438 | 1,542 | 2 | 0 | 0 | 12 | 14 | 54 | 0 | 7 | 230 | 291 |
| West (Dist. 7-c & 8) | 34 | 31 | 0 | 3 | 187,361 | 1,087 | 880 | 0 | 0 | 0 | 2 | 2 | 15 | 0 | 3 | 79 | 97 |
| Panhandle (Dist. 10) | 6 | 2 | 4 | 0 | 18,788 | 221 | 182 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 3 | 5 |
| Eastern (Dist. 5 & 6) | 11 | 8 | 2 | 1 | 66,878 | 257 | 388 | 0 | 0 | 0 | 1 | 1 | 4 | 0 | 3 | 54 | 61 |
| Gulf Coast (Dist. 3) | 39 | 26 | 1 | 12 | 219,423 | 813 | 939 | 1 | 0 | 0 | 4 | 5 | 38 | 20 | 19 | 142 | 219 |
| Southwest (Dist. 1, 2 & 4) | 30 | 14 | 1 | 15 | 154,660 | 724 | 309 | 1 | 0 | 1 | 11 | 13 | 41 | 7 | 14 | 174 | 236 |
| Louisiana | 50 | 32 | 2 | 16 | 343,944 | 679 | 684 | 0 | 1 | 2 | 5 | 8 | 18 | 12 | 9 | 94 | 133 |
| Northern | 22 | 16 | 0 | 6 | 66,718 | 355 | 375 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 3 | 51 | 56 |
| Southern | 28 | 16 | 2 | 10 | 277,226 | 324 | 309 | 0 | 1 | 2 | 4 | 7 | 17 | 11 | 6 | 43 | 77 |
| Arkansas | 4 | 2 | 0 | 2 | 22,908 | 135 | 97 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 26 | 27 |
| Mississippi | 15 | 10 | 0 | 5 | 119,172 | 244 | 138 | 0 | 0 | 0 | 3 | 3 | 0 | 0 | 1 | 49 | 50 |
| Southeastern States | 3 | 0 | 0 | 3 | 13,245 | 25 | 23 | 0 | 0 | 0 | 3 | 3 | 0 | 0 | 0 | 22 | 22 |
| Montana | 3 | 3 | 0 | 0 | 6,346 | 116 | 151 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 12 | 15 |
| Wyoming | 1 | 0 | 0 | 1 | 4,025 | 107 | 88 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 2 | 17 | 26 |
| Colorado-Utah | 4 | 4 | 0 | 0 | 25,611 | 97 | 70 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 23 | 25 |
| New Mexico | 11 | 9 | 1 | 1 | 50,794 | 289 | 191 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 1 | 19 | 24 |
| California | 31 | 24 | 1 | 6 | 144,634 | 1,043 | 967 | 4 | 0 | 0 | 5 | 9 | 29 | 0 | 5 | 154 | 188 |
| Total United States | 673 | 369 | 60 | 244 | 2,431,349 | 16,014 | 14,931 | 13 | 1 | 3 | 78 | 95 | 339 | 42 | 96 | 1,981 | 2,458 |
| Total previous week | 658 | 355 | 72 | 231 | 2,355,444 | 15,341 | 14,395 | 12 | 1 | 5 | 75 | 93 | 326 | 41 | 93 | 1,903 | 2,363 |
| Total July 13, 1946 | 536 | 277 | 68 | 191 | 1,758,058 | | | 9 | 0 | 4 | 64 | 77 | 270 | 23 | 64 | 1,713 | 2,070 |

Service wells included: *19, †24.

## CRUDE PRICES AND REFINERY ACTIVITY

### GRAVITY SCHEDULES

Top prices include all gravities above grades designated, and low prices include all gravities below grades designated:

| Gravity— | Signal Hill, Calif.* | Okla-homa, Kansas | Gulf Coast Tex.† | West Tex.‡ |
|---|---|---|---|---|
| 18-18.9 | $1.60 | .... | .... | .... |
| 19-19.9 | 1.65 | .... | .... | .... |
| 20-20.9 | 1.69 | $1.55 | .... | $1.42 |
| 21-21.9 | 1.73 | 1.57 | .... | 1.44 |
| 22-22.9 | 1.77 | 1.59 | .... | 1.46 |
| 23-23.9 | 1.80 | 1.61 | .... | 1.48 |
| 24-24.9 | 1.84 | 1.63 | $1.86 | 1.50 |
| 25-25.9 | 1.88 | 1.65 | 1.88 | 1.52 |
| 26-26.9 | 1.91 | 1.67 | 1.90 | 1.54 |
| 27-27.9 | 1.95 | 1.69 | 1.92 | 1.56 |
| 28-28.9 | 1.99 | 1.71 | 1.94 | 1.58 |
| 29-29.9 | 2.02 | 1.73 | 1.96 | 1.60 |
| 30-30.9 | 2.06 | 1.75 | 1.98 | 1.62 |
| 31-31.9 | .... | 1.77 | 2.00 | 1.64 |
| 32-32.9 | .... | 1.79 | 2.02 | 1.66 |
| 33-33.9 | .... | 1.81 | 2.04 | 1.68 |
| 34-34.9 | .... | 1.83 | 2.06 | 1.70 |
| 35-35.9 | .... | 1.85 | 2.08 | 1.72 |
| 36-36.9 | .... | 1.87 | 2.10 | 1.74 |
| 37-37.9 | .... | 1.89 | 2.12 | 1.76 |
| 38-38.9 | .... | 1.91 | 2.14 | 1.78 |
| 39-39.9 | .... | 1.93 | 2.16 | 1.80 |
| 40 and above | .... | 1.95 | 2.18 | 1.82 |

*Standard Oil Co. of Calif. posting. †For crude from Daboval, El Campo, and Sandy Point. ‡Includes Lea County, New Mexico.

### A.P.I. REFINERY REPORT, WEEK ENDED JULY 5

(Thousands of barrels)

| District— | Crude runs, daily avg. | Production | | | | Stocks at refineries, bulk terminals, in transit and in pipe lines | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Gasoline† | Kerosine | Gas & dist. oil | Residual | Gasoline* | Kerosine | Gas & dist. oil | Residual |
| East Coast | 886 | 2,183 | 302 | 1,005 | 1,749 | 20,328 | 6,782 | 12,330 | 8,701 |
| Appalachian: | | | | | | | | | |
| District 1 | 87 | 255 | 42 | 68 | 84 | 2,242 | 284 | 438 | 243 |
| District 2 | 70 | 198 | 22 | 37 | 78 | 998 | 123 | 145 | 122 |
| Ind., Ill., Ky. | 823 | 2,901 | 274 | 799 | 1,036 | 16,030 | 1,686 | 4,486 | 3,430 |
| Okla., Kans., Mo. | 416 | 1,493 | 179 | 479 | 488 | 8,179 | 704 | 1,796 | 1,143 |
| Inland Texas | 240 | 1,056 | 94 | 131 | 437 | 3,415 | 340 | 415 | 722 |
| Texas Gulf Coast | 1,151 | 3,802 | 562 | 1,331 | 1,597 | 14,324 | 2,229 | 7,010 | 5,641 |
| La. Gulf Coast | 417 | 1,080 | 353 | 696 | 449 | 4,163 | 1,564 | 2,438 | 1,440 |
| N. La. and Ark. | 66 | 178 | 49 | 59 | 97 | 1,654 | 295 | 337 | 139 |
| Rocky Mountain: | | | | | | | | | |
| New Mexico | 10 | 43 | 3 | 11 | 20 | 91 | 10 | 41 | 35 |
| Other Rocky Mtn. | 131 | 416 | 20 | 149 | 192 | 2,912 | 114 | 663 | 679 |
| California | 812 | 2,154 | 63 | 894 | 2,258 | 15,338 | 726 | 12,901 | 26,856 |
| July 5, 1947 | 5,109 | 15,759 | 1,963 | 5,659 | 8,485 | 89,674 | 14,857 | 43,000 | 49,151 |
| June 28, 1947 | 5,093 | 16,070 | 1,969 | 5,606 | 8,298 | 91,806 | 14,369 | 41,721 | 48,490 |
| July 6, 1946 | 4,874 | 14,537 | 1,901 | 5,552 | 8,155 | 91,627 | 14,597 | 40,166 | 47,475 |

*At refineries including natural blended. †Finished and unfinished.

Bureau of Mines crude-oil stocks 233,810,000 bbl. as of July 5—down 2,411,000 bbl. One year ago 222,377,000 bbl.

### FLAT CRUDE PRICES

Representative posted schedules per bbl.

| | |
|---|---|
| East Texas | $1.95 |
| Kettleman Hills, California* | 2.14 |
| Beauregard Parish | 1.90 |
| Illinois Basin | 2.07 |
| Pecos County, Texas (Yates) | 1.85 |
| Bradford, Pennsylvania | 4.20 |
| Eastern Ill. and Western Ind.† | 2.07 |
| Tomball, Texas Gulf Coast | 2.10 |

*37°-37.9°. †35° and above.

# TRENDS

## DAILY AVERAGE PRODUCTION FOR WEEK

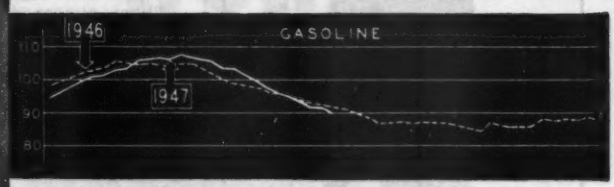
| | July 12 crude oil | B. of M. July demand | July 5 crude oil |
|---|---|---|---|
| Alabama | 1,200 | 1,200 | 1,100 |
| Arkansas | 80,750 | 80,000 | 80,950 |
| California | 918,750 | 900,000 | 920,000 |
| Colorado | 42,240 | 42,000 | 40,070 |
| Eastern | 63,600 | 65,400 | 64,600 |
| Florida | 975 | 600 | 1,200 |
| Illinois | 178,000 | 208,000 | 183,100 |
| Indiana | 17,900 | 18,000 | 18,000 |
| Kansas | 285,750 | 290,000 | 290,600 |
| Kentucky | 25,900 | 28,000 | 26,800 |
| Louisiana | 421,250 | 425,000 | 428,100 |
| North Louisiana | 96,700 | ..... | 104,900 |
| South Louisiana | 324,550 | ..... | 323,200 |
| Michigan | 54,025 | 45,000 | 40,915 |
| Mississippi | 97,310 | 90,000 | 95,510 |
| Montana | 22,520 | 24,000 | 24,630 |
| Nebraska | 550 | 600 | 550 |
| New Mexico | 108,150 | 104,000 | 107,210 |
| Oklahoma | 387,900 | 390,000 | 388,250 |
| Texas | 2,224,050 | 2,190,000 | 2,251,855 |
| Dist. 1 (Southwest) | 22,390 | ..... | 22,070 |
| Dist. 2 (Southwest) | 163,360 | ..... | 164,730 |
| Dist. 4 (Southwest) | 241,625 | ..... | 244,235 |
| Dist. 3 (Gulf Coast) | 479,675 | ..... | 486,020 |
| Dist. 5 (Eastern) | 39,155 | ..... | 39,500 |
| Dist. 6 (Eastern) | 113,400 | ..... | 114,555 |
| East Texas Field | 324,000 | ..... | 328,285 |
| Dist. 7-C (West) | 38,840 | ..... | 38,905 |
| Dist. 8 (West) | 555,250 | ..... | 557,605 |
| Dist. 7-B (W. Central) | 37,075 | ..... | 38,115 |
| Dist. 9 (N. Central) | 125,500 | ..... | 132,355 |
| Dist. 10 (Panhandle) | 83,780 | ..... | 85,480 |
| Wyoming | 113,350 | 118,000 | 115,720 |
| Miscellaneous | ..... | 200 | ..... |
| Total United States | *5,044,170 | 5,020,000 | 5,079,160 |

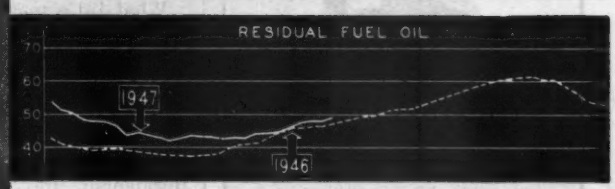
Change from prev. wk., dn. 34,990

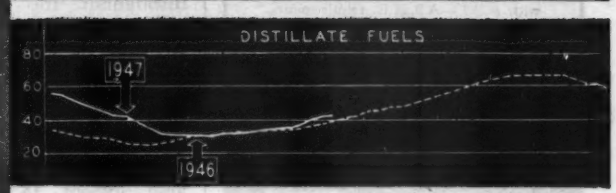
Total production January 1-July 12..... †951,093,620 bbl.

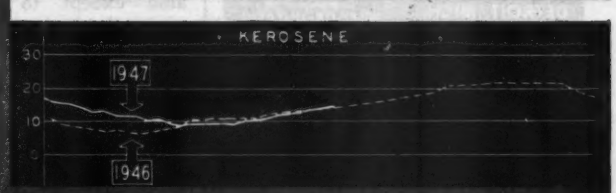
Same period last year (crude plus cond.).. 905,903,620 bbl.

*Not incl. 31,050 bbl. condensate. †Incl. 5,573,570 bbl. condensate.

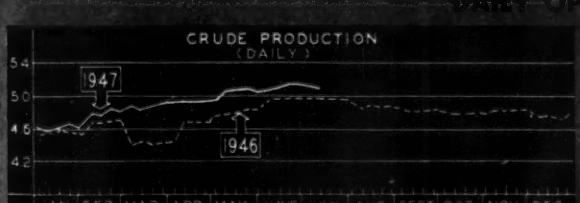


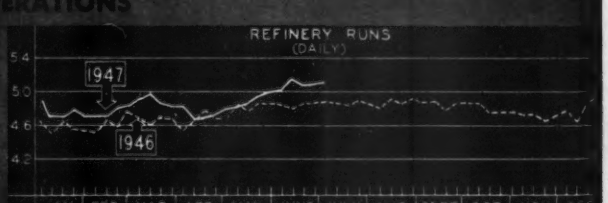



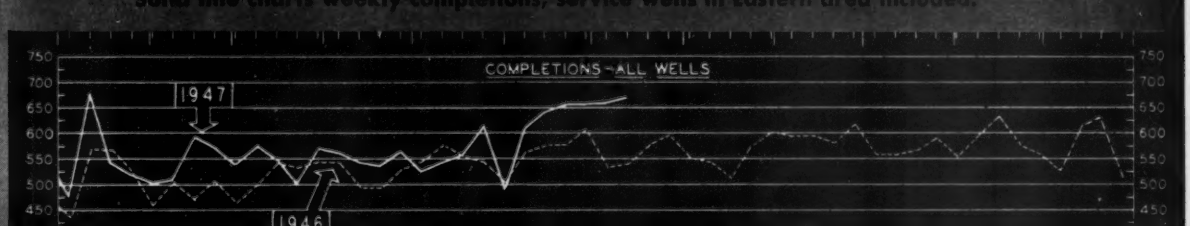




## OPERATIONS




Solid line charts weekly completions, service wells in Eastern area included.



PENBERTHY

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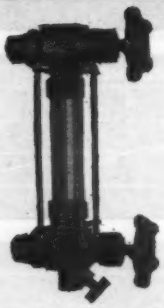
LIQUID LEVEL GAGES



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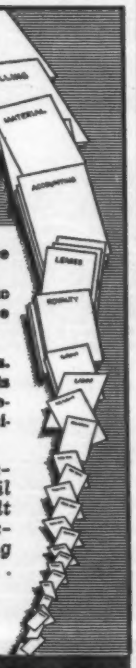

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WRITE FOR NEW CATALOG NO. 471

ROSS-MARTIN COMPANY

STANDARD FORMS DIVISION OF

The MID-WEST PRINTING Company

413 E. 4th St., Tulsa 1, Oklahoma

# MARKETS

PRICE advances in scattered but important sections of the country occurred last week under the pressure of the strongest demand for petroleum products in the history of the industry.

There appeared to be some sentiment, particularly among larger companies, for a "hold the line" policy, and prices for contract material continued to range up to ½ cent under the going spot market which was characterized by urgent appeals from buyers.

What little material moved on the open market in many cases was commanding premiums. Some independent distributors in the midwestern section, their sources cut off or reduced as a result of recently announced allocation programs, sought gasoline for immediate delivery throughout the Mid-Continent or burning-oil commitments to meet an expected short supply this winter. Price was said to be "no consideration."

### Contract Gasoline Price Steady

Little if any gasoline was available except to contract accounts where the tank-car price remained at 8 cents for regular. Mid-Continent distillate burning oils generally advanced ⅛ cent late in the week. No. 2 was quoted at 6¼ cents, though spot market prices were at least ¼ higher. Residual fuel-oil prices remained strong with one marketer reporting a shipment at $2.35 per barrel, f.o.b North Texas.

In Dallas, one market source told of a shipment of five cars premium grade gasoline at 10 cents, 1 cent above the generally posted price. This official expressed belief that both products and crude markets may become nonexistent with posted prices meaning little in view of bonuses and premiums being paid.

Texas gasoline consumers were paying generally 1 cent more at the pump after Humble Oil & Refining Co. became the last of the major companies to post higher prices. A ½-cent increase was made in tank-wagon prices, to 16½ cents for regular in North Texas.

### Rocky Mountain Supplies Adequate

Vacationists and other travelers in the Rocky Mountain area were assured of adequate motor-fuel supplies by M. H. Robineau, Frontier Refining Co. president, who said there is no present need for allocation programs in Colorado, Wyoming, and Montana.

Standard Oil Co. (Ohio) increased its service-station price 1 cent with a ¾-cent increase to dealers, declaring it necessary because of postwar increases in costs. Excluding tax, the retail price of regular was 16½ cents.

Prices for all products remained generally firm along the Atlantic Coast, but higher gasoline prices in the near future were indicated in statements of company officials. They pointed out an increase of ½ cent in tank-wagon was likely. Suppliers, looking ahead to the winter heating-oil season, said many consumers are cooperating in keeping their tanks full during the warm weather. Residual fuel oil and gasoline was in heavy demand with little material on the open market.

Directors of the Oil-Heat Institute of America meeting in New Hampshire heard a report in its campaign to have all fuel-oil storage kept full this summer. O.H.I. is making a search for unused storage facilities that can be put in service.

## Representative Quotations

Representative spot-market quotations of leading suppliers as of July 14, 1947. Figures are f.o.b. plant for tank-car shipment in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

**GASOLINE, KEROSINE, AND FUEL OILS**

| | Mid-Continent Group 3 | New York Harbor | Texas Gulf Coast |
|---|---|---|---|
| Regular gasoline, 73-75 octane | 8-8.75 | 10.1-10.4* 9.3-9.5† | 8.5-9.5 |
| Premium gasoline, 78-80 octane | 8.75-9.5 | 10.2-12 | 9-9.5 |
| 42-44 w.w. kerosine | 7.125-7.375 | 7.8 | 7-7.25 |
| No. 2 straw fuel oil | 6.25-7 | 6.8-7.1 | 6-6.5 |
| No. 6 residual | $2.15-2.45 | $2.33-2.50 | $1.73-2.50 |

*Branded (74-76 octane); †Unbranded (74-76 octane).

**NATURAL GASOLINE**

| | Group 3 | North Texas | N. La. |
|---|---|---|---|
| Grade 26-70 | 5.875 | 5.375 | 5.625 |
| Grade 18-55 | 7.05 | 6.45 | 6.75 |

**LUBRICATING OILS**

South Texas

| | |
|---|---|
| 200 vis., No. 3-3 neutral | 11.5-12.5 |
| 750 vis., No. 3-4 neutral | 13.5-15.25 |
| 2,000 No. 5-6 neutral | 15-16.75 |

**LUBRICATING OILS**

Mid-Continent

| | |
|---|---|
| 150-160 vis. D bright stock, 0-10 p.p. | 29 |
| 200 vis. No. 3 neutral, 0-10 p.p. | 18-19 |

Western Pennsylvania

| | |
|---|---|
| 145-155 vis. 10 p.t. bright stock | 43 |
| 180 vis. 0 p.t. neutral | 43 |

**CRUDE-SCALE WAX**

Mid-Continent

| | |
|---|---|
| 130-132 A.S.T.M. melting point | 6.75-7.75 |

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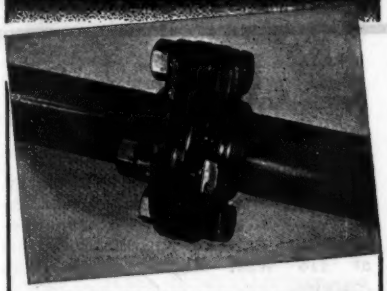
*"By Commercial"*
## HAS WHAT IT TAKES!



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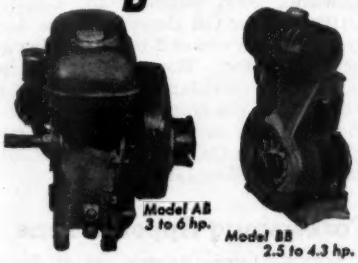
## BEE-LINE ENGINES

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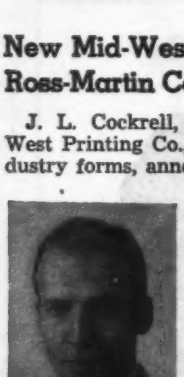
# EQUIPMENT MEN ... in the News

## New Mid-West Division: Ross-Martin Co.

J. L. Cockrell, president of Mid-West Printing Co., supplier of oil-industry forms, announced in Tulsa the



R. E. COCKRELL

B. A. BRAMMER

formation of a new division of the company to be known as Ross-Martin Co. Officers for the new company who will be in immediate contact with the industry include Bert A. Brammer as sales manager and R. E. Cockrell as office manager. The Kraftbilt standard forms offered by the company will include practically all the forms marketed by Mid-West in the past. No change in form identification or operating policies will be made.

Head of the new organization is Ralph T. Curtis, who has had many years of merchandising experience. He resigned as advertising manager of a large publishing house to manage the company. W. W. McCarty is director of research and development. Brammer, sales manager, brings to the company an enviable sales record in the printing industry. J. M. Lanigan, director of advertising, had been in charge of standard forms, sales, and advertising for Mid-West for more than 10 years. Cockrell, a graduate of Wharton School of Finance, was selected as office manager after a year's experience with Mid-West.

Offices of the new company are located at 423 East Fourth Street, Tulsa.

## Sales Personnel Changes

Bethlehem Steel Co. has announced the following changes in sales personnel: J. M. Ellis, general manager of sales, has been appointed assistant to vice president; K. L. Griffith, assistant general manager of sales, has been appointed general manager of sales; D. C. Roscoe, manager of sales, sheets and strip, has been named assistant general manager of sales; A. T. Hunt, manager of sales, galvanized sheets and formed products, has been appointed manager of sales, sheets and strip; and M. C. Schrader, assistant to the general manager, has been appointed assistant to the vice president.

## Personnel Changes In Cummins

At a recent meeting of the board of directors of Cummins Engine Co., Inc., Columbus, Ind., R. E. Huthsteiner, vice president and general manager, was elected a director to succeed Hugh T. Miller who died May 26. Edwin G. Crouch was elected secretary to succeed D. C. Bottorff who died June 3. Waldo M. Harrison was elected treasurer, and also will continue as controller. H. L. Knudsen resigned as vice president, but will continue as a director. Promotions included D. J. Cummins to manager of engineering and quality, and W. J. Manning to assistant controller.

## International Announces New Engine

H. T. Reishus, general manager of International Harvester Co.'s industrial power division, has announced the development of a new engine which is convertible in production as either a gasoline or diesel engine. It was revealed for the first time to 75 representatives of leading mechanical-engineering schools attending the Conference for Teachers of Diesel Engineering at the company's Melrose Park plant.

## Anderson New Vice President

Harold C. Anderson has been elected vice president of research engineering and development of Thermoid Co. In April 1946 he assumed charge of all company research, engineering, and development. During this time he was responsible for several major developments in Thermoid's automotive, industrial, oil-field, and textile products.

## Dunlop Texas Director

Richard D. Dunlop, associate director of research at Monsanto Chemical Co.'s Plastics Division at Springfield, Mass., has been named technical director in charge of research and development of the company's Texas division, with headquarters at Texas City, effective September 1.

## Fenn-Anstruther Western Representative

Iron & Steel Products, Inc., Chicago, have appointed Basil Fenn-Anstruther representative in California, Nevada, and Arizona, with headquarters at 416 West Eighth Street, Los Angeles.

## Baird Purchasing Agent

A. W. Baird, who has been assistant purchasing agent of National Supply Co., has been appointed purchasing agent for the company's Spang - Chalfant Division. J. M. Taylor has been appointed assistant purchasing agent of the company division.

A. W. BAIRD

## Wilson and Edwards Join Oil Base

Doyne L. Wilson has been appointed director of research, and Robert R. Edwards, mud engineer for Coastal California for Oil Base, Inc., Los Angeles. Wilson comes from Visco Products Co., Inc., Houston, where he served as assistant chief chemist. Edwards comes from Baroid Sales Division where he served as mud engineer in the Oklahoma, West Texas, and Rocky Mountain areas.

## Parkersburg Appoints Lyne

Joe A. Lyne, former chief field engineer for Parkersburg Rig & Reel Co., has been appointed Houston plant manager. He succeeds G. E. Dake, deceased. Lyne has been a member of the Parkersburg organization for 23 years. In his previous assignment as chief field engineer, he spent considerable time in foreign as well as domestic fields.

## Inglis Heads Rocanen

H. M. B. Inglis, formerly active in oil and gas operations in Alberta and who recently returned to civilian life after 4½ years service with the R.C.E., has been elected head of Rocanen Engineering Co., which will specialize in diamond-drill tests, field surveys, and similar work in western Canada.

## Monsanto Creates New Research Position

A new position in industrial research has been actuated by Monsanto Chemical Co. with the appointment of one of its foremost chemists as senior scientist to pursue pioneer work in new fields and techniques. Assistant Research Director Albert H. Bump, of the company's Merrimac Division at Everett, Mass., was named by Division General Manager Josiah B. Rutter to the new post created for men of unusual achievements and abilities to increase the scope of exploratory research.

Also announced is appointment of Chester L. Jones, Jr., as sales manager of Monsanto Chemical Co.'s protective coatings department. Jones, who has been manager of the product development department of Monsanto's Plastics Division at Springfield, Mass., will be headquartered at the Merrimac Division at Boston after August 1.

## Promotions in Link-Belt

Ralph W. Rausch, who has been assistant chief engineer at the Pershing Road plant, Link-Belt Co., Chicago, has been appointed chief engineer. He succeeds C. S. Huntington, who has retired because of ill health. H. Walter Regensburger, who has been assistant to the vice president in charge of engineering, at executive offices, Chicago, has been appointed divisional engineer in charge of estimate engineering at the Pershing Road plant. Eugene P. Berg, who has served as assistant to the president since the recent death of E. L. Berry, vice president in charge of production, has been appointed general superintendent at the plant. Joseph C. Spence has been appointed assistant to Harold L. Hoefman, vice president in charge of manufacturing, located at executive offices, 307 North Michigan Avenue.

## Reed Names Knight

*JACK F. KNIGHT*

Jack F. Knight has been promoted to manager of sales development of Reed Roller Bit Co., Houston. In his new work he will have charge of all promotional activities, both within the sales organization, and among customers. In 1945, after several years with Reed, he became assistant sales manager under R. G. Hamaker, vice president in charge of sales, who continues to direct all sales activities.

## Darnell Joins Bjorksten

James R. Darnell has joined Bjorksten Research Laboratories, Chicago, in the capacity of assistant to Dr. Johan Bjorksten, president.

## Gang President of Ludlow Valve

*O. F. GANG*

Oliver F. Gang has been elected president, director, and general manager of Ludlow Valve Manufacturing Co., Inc., Troy, N. Y. He succeeds A. W. Thompson, who becomes chairman of the executive committee and continues as treasurer. Gang recently resigned as vice president of William Powell Co., valve manufacturers of Cincinnati and New York.

## U. S. Rubber Promotes Three Sales Executives

Three executive promotions in the tire division of United States Rubber Co. are announced by J. W. McGovern, vice president and general manager of the division. Walter D. Baldwin was appointed director of manufacturers sales, with offices in Detroit. J. Chester Ray was named to succeed Baldwin as sales manager of the company's U. S. Tires division. Harry M. Ramsay will succeed Ray as sales manager of the Fisk Tires division of the company. Ray and Ramsay will maintain their headquarters at the company's general offices in Rockefeller Center, New York.

***Consolidation of the Tulsa general office of Bethlehem Supply Co. and the district sales office of Bethlehem Steel Co., recently has been effected by occupancy of the Bethlehem Building at East Second Street and South Boston Avenue in Tulsa. The Bethlehem Building was purchased in 1946 as a part of the company's expansion program, which included enlargements and improvements to both the Tulsa and Corsicana manufacturing plants***

## Behrhorst and Meredith Transferred

W. F. (Bill) Behrhorst, who for several years has been district representative in Kansas for American Iron & Machine Works Co., has been transferred to California district. He will make his headquarters in Whittier. Roy Meredith is now district representative in Kansas, Eastern Colorado, and the Panhandle. He will headquarter at Great Bend. For several years Meredith has been in charge of the Alice, Tex., rental division for American Iron.

## Product Study Completed

"Jack" Clemens, who has recently returned to the United States from a 6½-month South American trip, and "Mutt" Donovan, factory engineer, who has been stationed in Texas and Louisiana, have just completed an intensive study of product development at the Martin-Decker plant in Long Beach. Clemens is now stationed at Houston where he will assist Gulf Coast customers in the use of company products. Donovan is now servicing the Mid-Continent from headquarters in Oklahoma City.

# Classified Advertising

***The Market Place for the Oil Industry***

## UNDISPLAYED

All ads except Situations Wanted, 10 cents a word. Minimum charge, $2.00 per insertion.
Situations Wanted ads, 5 cents a word. Minimum charge, $1.00 per insertion.
Centered Line, any ad, 75 cents.
Box Numbers count 9 words when replies are to be sent to our Tulsa Office. Replies forwarded without charge.

## DISPLAYED, PER INCH

$9.00 per column inch per insertion. One-point border and 12-point capitals are allowed. Larger type sizes not accepted.

All classified advertising payable in advance.
10% Discount if 3 insertions are ordered at one time.
COPY DEADLINE, 9:00 a.m. Monday prior to each week's issue.

**THE OIL AND GAS JOURNAL**
P. O. Box 1260, TULSA, OKLAHOMA

### EQUIPMENT FOR SALE

FOR SALE: Six New Kobe, 2½ inch tubing insert, pumps, one Triplex—Bargain for immediate sale. Ben Beckham, Jr., Box 134, Overton, Texas. Phone 3921.

FOR SALE: 83 SPEED STAR all steel Spudder on skids, Dual brakes, two forward speeds and instantaneous reverse on all reels. Cathead, telescopic derrick with power hoist, Hercules 6 Cyl. Engine with electric starter and Gasoline attachments. Approximately 3,500 Ft. ¾" and 9/16" practically new lines. Also ⅞" Non-Rotating casing line. Good condition. Price $6000.00. Contact Maurice Burdick, Phone #802. P. O. Box #3, Princeton, Indiana.

NEW BUDA DIESEL POWER UNITS—Closing out heavy industrial engine inventory. Offer rare price advantage on rugged Budas, Model 6-DT-468. Develop 100 hp. at 1600 r.p.m., completely enclosed units with clutch. Regular present list price, F.O.B. factory, $3200; our price, $2550, F.O.B. Youngstown. McCUNE & COMPANY, INC., 3721 Mahoning Ave., Youngstown, Ohio.

**TWO NEW**
**WAUKESHA LRO ENGINES**
**350 H.P.**

**Both recently received, still in original crates. Ready for immediate shipment.**
**Phone 4-3255**
**THE BREWSTER COMPANY, INC.**
**Shreveport, Louisiana**

**NEW A.P.I. STORAGE TANKS**

2—25,000 bbl., 80′ x 30′

2—40,000 bbl., 100′ x 30′

Above tanks knocked down and fabricated for welded construction. Each tank complete with steel roof, structural supports, accessories, and welding rods. Complete Bills of Material and erection blueprints available upon request. Location: Compton, Calif.

**HORWITZ PIPE & SUPPLY CO.**
Tulsa, Okla.

### EQUIPMENT FOR SALE

FOR SALE: Barber-Green ditcher, Model 44C, 18" X 5'6 boom equipped with new Chrysler 8 cylinder, 65 h.p. gasoline motor. Entire machine recently completely rebuilt. Can be inspected vicinity Rantoul, Franklin County, Kansas. Brundred Oil Corporation, 4722 Broadway, Kansas City 2, Missouri.

FOR SALE: 1—14" x 14" Ideal horizontal twin cylinder steam drilling engine. 2—15½" x 8½" x 20" Ideal steam slush pumps. Excellent condition. Priced right.
**Lucey Products Corporation,**
**Tulsa, Oklahoma.**

1—New R. L. Double Drum Cardwell Unit powered with WAK Waukesha engine; 1—R. L. Model, Double Drum Cardwell in first class condition, new MO-893 Buda engine, new bearings in jack shaft and lower drum and relined brakes. Both good buys. Write T. C. S. Drilling Company, Rangely, Colorado.

FOR SALE: Shaffer power draw works, powered by two J. L. 1335 Buda engines compounded. Suitable for 5,000 foot work. In A-1 condition. Price $7,500. Terms. Melton Well Service, Box 1360, Seminole, Oklahoma.

FOR SALE: Franks Single Drum 4000′ Pulling unit, 10" x 8" x 60′ mast, Double friction clutches, mounted on 5 Ton GMC Tandem truck. This unit is new, having done about 5 mo. work. J. A. Rives, Borger, Texas.

**SPECIAL BARGAIN**

**Wilson Atlas Power Rig**

First Class Condition

*Now Running In*
*Archer County*

**$35,000**

MAJOR ITEMS—

- 122′ Lee C. Moore Tubular Standard Derrick.
- Wilson Atlas Drawworks, powered by two P-1879 Buda Engines, equipped for butane.
- 7¼ x 14 Wheland Power Slush Pump.
- 17½ Wheland Oilbath Rotary Table.
- 66" Four Sheave Oil Well Traveling Block.
- 125 Ton Byron Jackson Triplex Hook.
- Five Sheave Ideco Crown Block.
- Thompson Shale Separator.
- Byron Jackson Tongs and Elevators.
- Five Kilowatt Light Plant.
- All Other Tools and Valves Necessary for Rigging Up and Drilling.
- Drill Pipe not included in price but available if desired.

**INDUSTRIAL SUPPLY CO.**
WICHITA FALLS, TEXAS
Phone L. D. 13

### EQUIPMENT FOR SALE

CULVERTS For Sale: 18" corrugated galvanized, sectional culverts. Will make any desired length and sustain heavy loads. Phone 3-9169, Tulsa, Oklahoma.

STEAM DRILLING ENGINE, Gardner-Denver, Model DEA-1000-12" x 12", horizontal twin cylinders, excellent condition. Write or call Joseph Weidenhoff, Inc., 4340 W. Roosevelt Rd., Chicago, Ill., Mr. D. R. Kennedy, Nevada 3233.

PRICED TO SELL: 20—Size 2,000 gal. Gasoline Tanks mounted on Semi Trailers, 4 tires, size 900 x 20, Budd Wheels. Complete with transfer unit, hose, air brakes. Good for Oil, Tanks, Water, Gasoline, etc. Mfg. by The Heil Company. Independent Tank Company, Seminole, Oklahoma, Box 102, Phone 977.

1 STAR 45 ST Spudder with Hercules engine. Both in excellent condition. No tools. Located 10 miles East of Drumright, Okla. 1 Ft. Worth Super D Spudder with practically two strings of tools, located on Lysite Mountain, Wyoming. Travco Equipment Company, 110 Midco Bldg., Tulsa, Oklahoma. Phone 5-2251.

**PRICED FOR QUICK SALE**

—One—12 x 12 Lucey Twin Cylinder enclosed oil bath Steam Drilling Engine Serial No. WL 234-GM 6000.

**WILL H. SMITH**
**Box 686, Ardmore, Okla.**

**FOR SALE**

7,500 Foot Full Electric Rig powered with two NKU Waukesha motors. Complete with two pumps, rotary, swivel, traveling block, blow-out preventor, 4½" drill pipe and all equipment except derrick to make complete rig. For full details call, wire or write

**K. S. RICHARDS**
Fort Worth 1, Texas
P.O. Box 443 Phone 3-5600

**$52,500**

**COMPLETE 700 h.p.**
**Rotary Drilling Rig**

Refer June 21 and June 28 issues of The Oil and Gas Journal, classified section, or write for detailed inventory.

**Lucey Products Corp.**
910 So. Boston Tulsa, Okla.

**FOR SALE**
**STEEL STORAGE TANKS**

26—10,000 Gallon Capacity Tank Car Tanks

**CLEANED PAINTED TESTED**
Located in Oklahoma

**IRON & STEEL PRODUCTS, INC.**
42 years' experience
13412 S. Brainard Avenue
Chicago 33, Illinois. PHONE BAYport 3456
"ANYTHING containing IRON or STEEL"